THE

VETERINARY JOURNAL

JUNE 1901.

Editorial.

MOUNTING AND REMOUNTING.

THE question of providing mounts for our troops is of great importance, and it might well be advisable to make a few statements on this subject.

This country may be involved in war either north or south of the Equator. If north, then mounts and remounts should be from northern climes; if south, then from climes south of the Equator. And why? Because in the north the lower animals put on their thick winter clothing in November or thereabouts, and cast it off and assume a summer clothing in or about April: rather rough on them to ask them to go to Africa in her summer time, October to March, with their winter clothes on, or *vice versa*, eh! And you can't help it in time of war, though in time of peace, and when you have a year to spare, you may send northern horses south and acclimatise them.

It is obvious, then, that we should obtain and keep mounts and remounts as much as possible on both sides of the Equator. Another thing, when at peace we have our cavalry regiments, consisting of, say, 500 officers, non-commissioned officers, and troopers, and 400 horses, with a reserve of 500 men, and when we place the regiment on a war footing we have 1000 trained men, 400 trained horses, but no reserve of horses, and we then give the regiment either drafts of horses from other regiments (which for the time being become nullified), or a mixture of the above and remounts which know nothing about anything.

Would it not be a good plan to place a number of horses in the reserve each year as well as a number of men, so that when a regiment is required to prepare for war not only would the reserve men come up but also the reserve horses?

I know that there are always enormous difficulties to overcome in the working out of any big scheme. The difficulties in this scheme may be insurmountable, but to me the scheme seems feasible to a considerable extent, though I do not for a moment believe it to be applicable to the whole army. Even if this were found workable in ten centres it would be of considerable value.

I would therefore suggest that each selected regiment should do as follows, say—regimental strength (peace footing), 600 officers, non-commissioned officers, and troopers, 500 horses. On a certain date in each year to be fixed, lend fifty selected horses to fifty selected people, each individual entering into a bond and finding security that he would do the following :—

I. Use the horse for driving in a carriage or some light vehicle, so that he should be kept fit and active, or use him for ordinary riding purposes.
II. Will not abuse, overwork, underwork, or starve him.
III. Will immediately report his illness and call in a veterinary surgeon at his own expense.
IV. Will send him up annually, or oftener if required, to the regimental depôt for purposes of identification, re-marking, &c.
V. Will give up possession of him whenever required for war or other purposes.
Will send him to the depôt every second year for three weeks' training.
Will insure him for a sum of £35, which insurance must be on behalf of the Government.
VI. At the expiry of eight years the horse to become the property of the borrower.

I append a table which may give one an idea of how the scheme could be initiated and carried on to a certain extent.

For the sake of clearness I have made fixed dates for each portion of the business, but this would not be necessary nor would it be convenient, as it would entail too great an increase in the number of men in barracks at one time (January), and perhaps too few horses at another time (December) for the number of men, but that could be adjusted, and the proportion of men to horses would not vary very much.

December 31st, 1901.—Strength, 500 horses in barracks.

1902,	Lent out.	In Barracks.
Jan. 1, ...	50	450.
„ 2, ...	50	450 + 100 remounts brought in = 550.
(During the period from now to December 31st there would be a loss from various causes of 10 per cent.)		
Dec. 31, ...	50	490 (60 cast dead, &c.)
(The number lent out must always be maintained by the regiment.)		
Total at expiry of first year, .	540	

1903,	Lent out.	In Barracks.
Jan. 1, ...	100	440 (50 to op.)
„ 2, ...	100	440 + 120 remounts = 560.
Dec. 31, ...	100	494 (66 cast, &c.)
Total at expiry of second year,	594	
1904,		
Jan. 1, ...	150	444 (50 to op.)
„ 2, ...	150	(444 + 130 remounts) = 570.
Dec. 31, ...	150	498 (72 cast, &c.)
Total at expiry of third year,	648	
1905,		
Jan. 1, ...	200	448 (50 to op.)
„ 2, ...	200	(448 + 120 remounts) = 568.
Dec. 31, ...	200	491 (77 cast, &c.)
Total at expiry of fourth year,	691	
1906,		
Jan. 1, ...	250	441.
„ 2, ...	250	441 + 130 remounts = 571.
Dec. 31, ...	250	489 (82 dead, &c.)
Total at expiry of fifth year, .	739	

We should thus have these 739 thoroughly trained troop horses, and only be at the expense of feeding and attending to 489; whilst the balance of reserve horses, 250 in number, would not even cost us reserve pay!

It is a matter for those who know to say whether or not a regiment of 600 all told would be able to break in 130 young horses a year without interfering with its other work.

I have placed the mortality, cast, and given away at 10 per cent., but I have no doubt 7 per cent. would be nearer the mark. The scheme, no doubt, is full of imperfections, but a committee of military and other men might perfect it.

Such a plan might easily be adapted for a considerable number of batteries of artillery.

There will be no lack of applicants for Government horses on the above conditions. In fact I am inclined to think that medical and veterinary practitioners would take thousands of such horses under such conditions.

W. Owen Williams.

Royal College of Veterinary Surgeons.

FIFTY-EIGHTH ANNUAL REPORT FOR THE YEAR 1900–1901.

THE Council of the Royal College of Veterinary Surgeons beg to present this the Fifty-eighth Annual Report of their proceedings for the year 1900-1901 to the members of the profession.

Election of Members of Council.

The Annual General Meeting was held in accordance with the Supplemental Charter on Wednesday, June 6th, 1900, when the following gentlemen were declared elected members of Council in the place of those who retired by rotation, viz. :—Professor J. M'Fadyean, Veterinary Colonel J. D. Lambert, C.B.; Messrs. W. A. Byrne, J. F. Simpson, J.P., R. C. Trigger, J.P., Sidney Villar, G. Wartnaby, and E. C. Winter.

Election of Officers.

At the First Meeting of Council, held on Friday, July 6th, Mr. A. C. Cope was unanimously elected President for the year; and the Vice-Presidents elected were as follows, viz. :—Professor J. R. Dewar; Messrs. J. H. Carter, Jas. Fraser, A. Lawson, J.P., S. Locke, and J. F. Simpson, J.P.

Mr. F. W. Wragg was re-elected Treasurer, and Mr. A. W. Hill Secretary and Registrar.

Death of Her Majesty Queen Victoria.

The Council, feeling they would be giving effect to the wishes of the profession, passed a resolution at a Special Meeting of Council held for the purpose as follows :—"That a vote of condolence be tendered to His Majesty the King on the death of Her late Majesty Queen Victoria—his Royal mother—and also to congratulate the King upon his accession to the throne." The following Address was sent, which has been graciously received and acknowledged, viz. :—

"The Council of the Royal College of Veterinary Surgeons, assembled in Special Meeting for the purpose, and as representative of the whole profession, express their sincere grief at the death of Her late Majesty Queen Victoria, during whose benign reign the veterinary art was by Her Royal Charter recognised as a profession, and has received protection and encouragement.

"They desire to place on record their appreciation of her many high and noble virtues, and especially of her sympathy with each and all her subjects.

"They also desire to condole with His Majesty King Edward VII. and the Royal Family on the great loss they have personally sustained.

"They humbly congratulate His Majesty on his accession to the throne, and assure him of their unswerving loyalty and devotion."

Alterations of, and Additions to, Bye-Laws and Regulations.

Bye-law 52 has been altered by adding the following words :—"Excepting only that any student who shall present a certificate granted by the

Educational Institute of Scotland, showing that he has passed an examination equivalent in all respects to their examination prevailing on the 30th June 1896, and then known as the Preliminary Medical Examination, shall be entitled to Registration as a Veterinary Student."

The Bye-law will now read as follows :—

" 52. Students who enter the Veterinary Schools shall, prior to their first Professional Examination by the Royal College of Veterinary Surgeons, produce a certificate entitling the holder to be registered as a Medical Student on June 30th, 1896. 'Excepting only that any Student who shall present a certificate granted by the Educational Institute of Scotland, showing that he has passed an Examination equivalent in all respects to their Examination prevailing on the 30th June 1896, and then known as the Preliminary Medical Examination, shall be entitled to Registration as a Veterinary Student.'"

Professional Examinations.

Examinations were held in May and December in Scotland, and in July and December in London, at which 432 candidates were presented for examination, and 78 were admitted members of the profession. The following figures show the total number of candidates presented, passed, and rejected in the various classes :—

Three Years Course.

	Presented.	Passed.	Rejected.
Class A,	—	—	—
Class B,	2	—	2
Class C (Oral),	22	9	13
Class C (Practical),	15	12	3

Four Years Course.

Class A,	127	79	48
Class B,	82	63	19
Class C,	96	78	18
Class D,	88	66	22

The three years having expired terminating the appointment of the Examiners, the following have been elected by the Council to constitute the new Board of Examiners :

Examination A.

Anatomy of Domesticated Animals.—W. H. Bloye, F.R.C.V.S.; John Blakeway, F.R.C.V.S.

Chemistry and Elementary Physics.—H. Somerville, B.Sc. Lond., J. M. H. Munro, D. Sc. Lond.

Biology: Elementary Zoology and Botany.—J. R. Green, D.Sc., M.A., F.L.S.; J. R. Ainsworth Davis, M.A., F.C.P., F.Z.S.

Examination B.

Anatomy of Domesticated Animals.—Geo. Fleming, C.B., LL.D., F.R.C.V.S., F.R.G.S. (since deceased); W. F. Peacock, M.D., *F.R.C.V.S.*, M.R.C.S., L.R.C.P., L.S.A.

Physiology and Histology.—T. H. Milroy, M.D., B.Sc., F.R.S.E.; J. B. Haycraft, M.D., D.Sc., F.R.S.E.

Stable Management, &c.—Veterinary Major R. Moore, F.R.C.V.S.; A. Wheatley, F.R.C.V.S.

Examination C.

Morbid Anatomy, Pathology, and Bacteriology.—R. F. C. Leith, M.B., F.R.C.P.E.; George Dean, M.B.

Materia Medica, Therapeutics, and Toxicology.—James Clark, F.R.C.V S.; F. T. G. Hobday, F.R.C.V.S.

Veterinary Hygiene and Dietetics.—W. Woods, F.R.C.V.S.; Veterinary Lieut.-Colonel J. A. Nunn, C.I.E., D.S.O., F.R.C.V.S., F.R.G.S.

Examination D.

Principles and Practice of Veterinary Medicine and Meat Inspection.—John Malcolm, F.R.C.V.S.; N. Almond, F.R.C.V.S.

Principles and Practice of Veterinary Surgery and Obstetrics.—W. Hunting, F.R.C.V.S.; H. Olver, J.P., F.R.C.V.S.

As a number of students remain whose examination must be conducted under the Three Years Course, it became necessary to appoint certain Examiners to act under both systems, viz.:

Class C (Oral).—"Diseases of the Horse."—W. Woods, F.R.C.V.S.; Veterinary Lieut.-Colonel J. A. Nunn, C.I.E., D.S.O., F.R.C.V.S., F.R.G.S.

"Diseases of Domesticated Animals other than the Horse."—James Clark, F.R.C.V.S.; F. T. G. Hobday, F.R.C.V.S.

Class C.—"Practical Diseases of the Horse."—W. Hunting, F.R.C.V.S.; H. Olver, J.P., F.R.C.V.S.

"Diseases of Cattle."—John Malcolm, F.R.C.V.S.; N. Almond, F.R.C.V.S.

Fellowship Examination.

An Examination for this degree was held in December last, and the undermentioned gentlemen were admitted Fellows, viz.:—Mr. J. H. Taylor, Darlington; Mr. J. H. Wynne, Denbigh; Mr. Charles Peirce, Paddington; and Mr. T. H. Ramsey, Market Drayton.

The new Board of Examiners for this degree is constituted as follows.

Veterinary Medicine and Surgery.—James Macqueen, F.R.C.V.S.

Veterinary Hygiene and Sanitary Science.—Geo. Fleming, C.B., LL.D., F.R.C.V.S., F.R.G.S. (since deceased).

Pathology and Bacteriology.—John Malcolm, F.R.C.V.S.

Steel Memorial Medals.

The Council, after due consideration, awarded these medals for this year to Professor J. R. U. Dewar, Principal, Dick Veterinary College, Edinburgh; and Professor A. E. Mettam, Principal, Royal Veterinary College of Ireland, Dublin.

Walley Memorial Examination.

The First Examination for the above prize was held on the 5th October last, when one candidate presented himself for examination, and after careful consideration by the Examiners, he was awarded the prize. The amount of the year's proceeds of the funds have therefore been given to

the successful candidate, Mr. W. S. Harris, of the Dick Veterinary College, Edinburgh.

Registration.

The Registration Committee have had under consideration 125 cases. These comprise complaints against members and registered practitioners for advertising, all of which, with one exception, have resulted satisfactorily; the exceptional instance was that of a registered practitioner to whom every indulgence and facility was given, but, as he persisted in carrying on the objectionable practice, his name was removed from the register.

The Committee have also had before them complaints against members for unprofessional conduct, and in one case it was found necessary to remove the name of a member of the College from the register.

The Council have to report that offences by unqualified persons in assuming the title of veterinary surgeon or using the words veterinary forge are becoming rarer, and are mostly discontinued on receipt of a caution. There has been one prosecution, resulting in the conviction of the offender with a fine of one pound and three guineas costs.

The Council have considered the applications for restoration of names to the register of persons who have been removed for various offences, and have acceded to them on evidence of good conduct in the meantime.

The Veterinary Surgeons Amendment Act, 1900.

Since the last annual general meeting a fresh Act of Parliament has become law in the interests of the veterinary profession, the effect of which is to place holders of the veterinary certificate of the Highland and Agricultural Society of Scotland on the same footing as other members of the veterinary profession. Until this Act came into force, holders of this certificate were in the anomalous position of being quite independent of the disciplinary powers of the Royal College of Veterinary Surgeons, and the Highland and Agricultural Society of Scotland had no jurisdiction over them. A few holders of the certificate took advantage of this state of things, and were guilty of conduct tending to bring disgrace on the profession. This was brought before the notice of the Highland and Agricultural Society of Scotland, and with their co-operation a Bill was promoted to amend this unsatisfactory position, and it need hardly be said that this received the tacit support of nearly every person holding the Highland Society's veterinary certificate.

The thanks of the Council are due, and have been tendered, to Sir T. Gibson Carmichael for his conduct of the Bill in the House of Commons, and to Lord Tweedmouth in the House of Lords.

Companies Acts.

The Companies Bill was closely watched through the House of Commons, in order to see that veterinary practitioners, in common with other professional bodies, were given protection from unqualified persons posing as companies and undertaking professional work; but when the Bill reached the Committee stage the clause dealing with this subject was withdrawn on the understanding that a separate measure for the same purpose would be brought in at some future time. The Council are assured on good authority that, in consequence of the pressure of work on the Government, this measure will have to stand over for the present, but the matter is being carefully watched by the Council.

Affiliation of the Royal Veterinary College of Ireland.

During the past year a Veterinary College has been incorporated by Royal Charter under the name of the Royal Veterinary College of Ireland, and affiliated to the Royal College of Veterinary Surgeons, thus enjoying similar privileges to the affiliated Colleges in England and Scotland.

Presentations.

Library.—Presentations have been made to the library by the following during the year:—By Dr. George Fleming, C.B., of his magnificent collection of books, consisting of about 900 volumes; "The Veterinarian," "Veterinary Journal," "Veterinary Record," "The Journal of Comparative Pathology and Therapeutics," and "Pharmaceutical Journal," by the editors; "The Calender of the Royal College of Surgeons of England;" "The Calendar of the Pharmaceutical Society;" "Calendar of the College of Preceptors;" "Annual Statistical and General Report of the Army Veterinary Department, 1899;" "Annual Reports of Proceedings Board of Agriculture for 1899;" "Annual Report of the Imperial Bacteriologist of India, with Tables, 1897–8 and 1899–1900;" "Canine and Feline Surgery," by F. T. G. Hobday; Merck's "Manual of Materia Medica," by the editor; "Annual Report of the Bengal Veterinary College, 1899–1900;" "Report on Surra," by Alfred Lingard; "Archives de Parasitologie," by R. Blanchard; "A Brochure on a Surgical Operating Table for the Horse," by J. A. W. Dollar; "The Art of Horse-Shoeing," third edition, by W. Hunting; "The Australasian Veterinary Journal," February 1901, by the editor; "Annual Report of the Veterinary Surgeon to the Corporation of the City of Glasgow," by A. M. Trotter.

Attendances of Members of Council.

	Council Meetings. (Total Number, 10.) Attendances.	Committee. Notices to attend.	Committee. Attendances.
James F. Simpson,	10	22	17
J. M'Fadyean,	7	12	5
R. C. Trigger,	8	13	12
J. D. Lambert,	5	5	2
W. A. Byrne,	8	5	1
E. C. Winter,	4	9	—
Sidney Villar,	8	10	4
G. Wartnaby,	8	12	10
W. F. Barrett,	7	24	15
W. T. J. Bower,	3	17	1
J. R. U. Dewar,	6	6	2
Charles Hartley,	6	10	3
Alex. Lawson,	8	12	10
Samuel Locke,	6	12	5
James M'Call,	5	11	1
W. Pritchard,	7	8	4
J. A. W. Dollar,	8	9	6
Gen. Sir F. Fitzwygram,	3	—	—
J. Penberthy,	6	23	12
A. W. Mason,	9	14	10
J. Abson,	8	12	5

	Council Meetings. (Total Number, 10.) Attendances.	Committee. Notices to Attend.	Committee. Attendances.
James Fraser,	6	15	8
F. Duck,	5	5	—
Charles Allen,	2	14	—
F. W. Wragg,	10	25	24
J. M'I. M'Call,	9	11	11
J. H. Carter,	7	15	7
W. Williams, deceased,	—	—	—
W. J. Mulvey,	10	25	23
W. A. Edgar,	5	20	1
W. O. Williams,	5	12	5
A. C. Cope,	10	26	14

Obituary.

According to the Registrar's Report the number of deaths recorded during the year has been seventy-four.

Alston, Thomas F., Tollcross, Edinburgh.
Barker, William, Middlesbrough, Yorks.
Barningham, D. C., Darlington.
Beard, Henry, Macclesfield, Cheshire.
Beeson, Stephen, Chalfont St. Peter, Bucks.
Beman, Robert Brooks, Peckham.
Bowler, Charles Stanley, Bawtry, Yorks.
Briggs, A. W., Halifax, Yorks.
Calvert, C. A., Tourville, Queensland, Australia.
Campsall, Thomas John, Rotherham, Yorks.
Clark, W. H. L., Saltash, Cornwall.
Connochie, William Dixon, Selkirk, N.B.
Cowell, George Whiting, Canterbury, Kent.
Campbell, Thomas, Kirkcudbright, N.B.
Davidson, R. D., Cogle, Caithness.
Dickie, James Gilmore, Glasgow, N.B.
Dunlop, Andrew, New Zealand.
Doig, John, Wigtown, N.B.
Ensor, E. T. C., N. Kensington, W.
Faulkner, Joseph, Rochdale, Lancs.
Ferguson, G. T., Gateshead-on-Tyne.
Fletcher, Arthur, Ayr, N.B.
Freeman, John, Hull.
Fulton, David, Mullingar.
Fleming, Geo., Combe Martin, N. Devon.
Gilmore, Isaiah G., Baillieborough, co. Cavan.
Good, William, Ludlow, Salop.
Hart, John Bush, Calcutta.
Hatton, Thomas, Stockwell, S.W.
Hetherington, James, Scotby, Cumberland.
Higgs, Henri Alfred, Oswestry, Salop.
Hirst, William H., Rotherham, Yorks.
Holland, Walter Johnstone, Manchester.
Hunting, W. H., Chelsea.
Hurrell, Clement H., Southminster.
Ironside, William, Drumnalroy, Cluny, Aberdeenshire.
Jones, F. J. B., Leicester.
Jones, John, Conway.
Kettlewell, Lieut.-Col. G. R., Indian Army.
Lanchester, Thomas, Bishop Auckland.
Lupton, James Irvine, Richmond, Surrey.
Leyshon, H., Mountain Ash, S. Wales.
Mackinder, Richard, Peterborough.
Martin, Samuel, Appleby, Westmoreland.
Mitchie, Thomas, Wellington, New Zealand.
Mitchell, Robert, Glasgow.
Millman, C. H., Stapleford.
Nicholson, John, Dover, Kent.
Park, Archibald, Hobart, Tasmania.
Pringle, William Slowan, Gateshead-on-Tyne.
Pritchard, Richard, Wolverhampton.
Redford, Thos., Winchester.
Rose, James, Leamington.
Rumboll, Henry Augustus, Bristol.
Rogers, T. W., Saffron Walden.
Sandeman, James, Jun., Kirriemuir.
Sanders, William, Studley, Warwickshire.
Scott, Frank, Orpington, Kent.
Sewell, Herbert, Army and Navy Club, London.
Simpson, Sir Henry L., Windsor.
Stanley, Henry, Old Kent Road.
Statham, George Augustus, Sudbury, Derbyshire.
Stewart, James, Monmouth.
Stickney, J. H., Boston, Mass., U.S.A.
Temple William, Chester-le-Street, Durham.
Thomas, Edward, Carno, Montgomeryshire.
Tinsley, Richard William, Malton, Yorks.
Treacy, Michael J., U.S. America.
Watkins, George Henry, Lichfield.
White, G. H., Walsall, Staffs.
Williams, Thomas, Bethseda, Carnavonshire.
Williams, Professor W., Prin. New Vet. College, Edinburgh.
Williamson, Christopher, Beaconsfield.
Wright, John, Kidderminster.

Election of Auditors.

Messrs. Warner and Woodger were unanimously re-elected auditors for the ensuing year.

Annexed is Financial Statement.

F. W. WRAGG. Esq., Treasurer, *in Account with the Royal College of Veterinary Surgeons for the Financial Period from 1st May 1900 to 30th April 1901.*

Dr.				*Cr.*		
To Cash at Bankers and in hand,			£307 2 5	By Examiners' Fees and Expenses,		£1390 6 0
Examination and Registration Fees,			1935 16 0	Fellowship Examiners' Fees,		15 15 0
Fellowship Examination Fees,	£68 5 0			Reporters,		32 15 8
Do. do. in hand for Examination in May,	26 5 0			Law Expenses,		123 1 9
		94 10 0		Audit Fee,		5 5 0
Restoration Fees,		6 6 0		Salaries and Wages (including grant to previous Secretary),		421 0 0
Dividends on Consols,		198 16 8		Rates and Taxes,		75 1 4
Hire of Room,		5 15 6		Printing, Engraving, and Stationery,		173 5 9
Sale of Register,		19 7 3		Gas and Fuel,		13 2 6
				House Expenses,		16 2 10
				Advertising,		13 6 8
				Library and Museum (cost of removal of Library presented by the late Dr. Fleming),		12 11 0
				Repairs to Premises,		2 19 6
				Delegates' Expenses,		7 1 0
				Insurance,		9 2 0
				Sundries, Petty Cash, &c.		83 11 8
				Cash at Bank,	£160 9 8	
				Cash in hands of Secretary,	11 16 6	
						172 6 2
		£2567 13 10				£2567 13 10

Amount of Stock standing in the names of Trustees in British Consols—				Walley Memorial Fund—		
General Fund,			£7610 13 1	Stock,		£278 12 0
				Cash and Interest, as per last Account.	£9 5 0	
Steel Memorial Fund—				Accrued Interest at Bank,	7 5 8	
Stock,			£269 1 3		£16 10 8	
Cash and Interest, as per last Account,	£23 14 7			Cash Prize,	7 6 10	
Accrued Interest at Bank,	7 0 4					9 3 10
	£30 14 11					£287 15 10
Cash paid for Medals,	2 0 0			Bursary Account—		
		28 14 11		Stock,		£834 16 3
				Cash and Interest, as per last Account,	£52 3 5	
				Accrued Interest at Bank,	22 11 4	
						74 14 9
		£297 16 2				£939 8 0

ARTHUR W. HILL,
Secretary.

We, the undersigned, have examined the above Accounts, and find them correct.

RICHARD WARNER, F.C.A.,
JOSEPH WOODGER, } *Auditors.*

7th May 1901.

Royal College of Veterinary Surgeons.

MAY EXAMINATIONS IN EDINBURGH.

NEW VETERINARY COLLEGE.

At the May Examinations of the Royal College of Veterinary Surgeons, held in Edinburgh at the New Veterinary College on May 21st, 22nd, and 23rd, the following students from the New Veterinary College passed their examinations :—

Class "D," and obtained their Diplomas—Messrs. S. C. Binks, Alnmouth; H. Barrow, Failsworth, Manchester; H. B. Kauntze, Oldham; W. Lawson, Rothbury; H. H. Lord, Eccles, Manchester; J. P. Stableford, Warwick; A. A. Walker, Bradford; J. D. C. Word, Goole; J. T. Willows, Long Sutton; M. H. Sowerby Coo, Edinburgh.

Class "C," three years, and obtained their Diplomas—Messrs. W. G. Greaves, Manchester; A. A. Scotson, Newton-le-Willows.

Class "C," four years—Messrs. W. Hepburn, H. Kirby.

Class "B"—Messrs Stanley Elley, R. M. Jones, C. H. Wadlow.

Class "A"—Messrs. T. Bone,† J. Cameron, J. B. Chadwick, H. E. Cross,* W. G. Darling, E. E. Elphick, S. H. Gaiger,† A. E. Massy, J. Macaulay, J. Muirhead, H. W. Robinson, R. Tindle, and H. A. Turner.

* 1st Class Honours. † 2nd Class Honours.

New Veterinary College, Edinburgh.

PRIZE LIST 1900-1901.

CLASS "A."

CHEMISTRY—

Highland and Agricultural Society's Silver Medal—Mr. H. E. Cross.

1st Class Certificates—Messrs. H. E. Cross, S. H. Gaiger, J. T. Muirhead.

2nd Class Certificates—Messrs. C. Elphick, E. E. Elphick.

JUNIOR ANATOMY—

Highland and Agricultural Society's Silver Medal—Mr. H. E. Cross.

1st Class Certificates—Messrs. H. E. Cross, S. H. Gaiger, T. Bone, C. Elphick, A. E. Massy.

2nd Class Certificates—Messrs. J. T. Muirhead, E. E. Elphick, J. Cameron.

BIOLOGY—

Highland and Agricultural Society's Silver Medal—Mr. T. Bone.

1st Class Certificates—Messrs. T. Bone, S. H. Gaiger, A. E. Massy, J. T. Muirhead, H. E. Cross, R. Tindle.

2nd Class Certificates—Messrs. C. Elphick, E. E. Elphick, H. A. Turner, G. H. Petch.

PHYSICS—

Medal—Mr. H. E. Cross.

CLASS "B."

PHYSIOLOGY—
Highland and Agricultural Society's Silver Medal—Mr. Stanley Elley.
1st Class Certificate—Mr. S. Elley.
2nd Class Certificate—Messrs. P. Reilly, A. Barr.

SENIOR ANATOMY—
Highland and Agricultural Society's Medal—Mr. C. H. Wadlow.
1st Class Certificates—Messrs. C. H. Wadlow, P. Reilly, A. Barr.

STABLE MANAGEMENT—
Highland and Agricultural Society's Silver Medal—Mr. P. Reilly.
1st Class Certificates—Mr. P. Reilly, C. H. Wadlow, S. Elley, R M. Jones.
2nd Class Certificates—Messrs. J. Aitken, J. A. Fearnside, R. P. Rankin.

HISTOLOGY—
Medal—Mr. Stanley Elley.
1st Class Certificate—Mr. P. Reilly.

CLASS "C."

GENERAL PATHOLOGY—
Highland and Agricultural Society's Silver Medal—Mr. A. Macfarlane.
1st Class Certificates—Messrs. A. Macfarlane, R. Hayes.

MATERIA MEDICA—
Highland and Agricultural Society's Silver Medal—Mr. H. Kirby.
1st Class Certificates—Messrs. H. Kirby, W. Hepburn, Tom Walker, J. A. Shaw.
2nd Class Certificates—Messrs. R. Hayes, A. Macfarlane.

HYGIENE—
Highland and Agricultural Society's Silver Medal—Mr. H. Kirby.
1st Class Certificates—Messrs. H. Kirby, W. Hepburn.
2nd Class Certificates—Messrs. A. Macfarlane, F. H. Sugden, Tom Walker.

CLASS "D."

VETERINARY SURGERY—
Highland and Agricultural Society's Silver Medal—Mr. W. Lawson.
1st Certificates—Messrs. W. Lawson, H. H. Lord, H. B. Kauntze, F. Dunning.
2nd Class Class Certificates—Messrs. S. C. Binks, A. A. Walker, R. Finch.

VETERINARY MEDICINE—
Highland and Agricultural Society's Silver Medal—Mr. R. Finch.
1st Class Certificates—Messrs. R. Finch, F. Dunning, R. Scott, H. H. Lord, H. B. Kauntze.
2nd Class Certificates—Messrs. M. H. Sowerby Coo, W. Lawson.

MEAT INSPECTION—
Silver Medal—Mr. S. C. Binks.
1st Class Certificates—Messrs. S. C. Binks, H. H. Lord, W. Lawson, J. D. C. Ward, H. Barrow, G. T. Willows, M. H. Sowerby Coo, A. A. Walker, J. Latta, R. Scott, R. Finch, H. B. Kauntze, F. Dunning.

PRINCIPAL'S £20 GOLD MEDAL—Mr. G. T. Willows.

£25 FOR THE BEST STUDENT, BY AN OLD STUDENT, *to be presented when result of Class "D" Final Examination is made known*—Mr. Sowerby Coo.

DEMONSTRATORS OF PATHOLOGY—
Medal—Mr. W. Hepburn.

DEMONSTRATORS OF ANATOMY—
Medal—Mr. James Latta.
Do. R. Finch.

PRACTICAL ANATOMY—
Silver Medal—Mr. Stanley Elley.

CURATOR OF MUSEUM—
Medal—Mr. C. H. Harrison.

BEST ESSAY—
Edinburgh Veterinary Medical Society's Silver Medal—Mr. R. Finch.
1st Certificates—Messrs. J. Latta and R. Scott.

PRESIDENT'S SPECIAL ESSAY—
Edinburgh Veterinary Medical Society's Silver Medal—Mr. R. Finch.
1st Certificate—Mr. R. Scott.

BEST COMMUNICATION—
Edinburgh Veterinary Medical Society's Silver Medal—Mr. James Latta.
1st Certificates—Messrs. H. Barrow and S. C. Binks.

At the above distribution, Principal Williams in his closing remarks to the students said there was a very pleasing prospect before those who would probably qualify next week, because there were more vacancies in the veterinary profession than there were candidates for the Royal College of Veterinary Surgeons. A question that had been agitating their profession was the administration of the Army Veterinary Department. The members of that Department, according to the conditions of their engagement, were not permitted to discuss their grievances in the public Press. They were not badly paid, they made no grumble about their pay, and they were not badly dressed, although it was not a comfortable dress in hot weather. The serious objection was that, no matter what rank they held as veterinary officers, they always were actually in the position of the most junior subaltern of the army. He instanced the case of a troopship which recently went out to South Africa with a consignment of horses under the care of a veterinary major. On calling at Gibraltar or Malta, a newly

joined subaltern from a militia regiment was taken on board, and he at once took command of the ship, displacing the veterinary officer, who held a higher rank. When the medical profession could not gain their ends in connection with the Army Medical Service, they resorted to boycotting. Medical men would not go into the army until a large number of their grievances were adjusted, and all he could say was that those who desired to see the Army Veterinary Department improved should not go into the army unless they were certain they would attain the proper position that they considered their due. (Applause.) The medals and certificates were afterwards presented.

Original Papers.

ON DISEASE IN THE NERVOUS SYSTEM OF HORSES.

HEREDITARY ATAXIA?

BY CHALMERS WATSON, M.B., M.R.C.P.E.

In a former paper I described the clinical features and the pathology of a case which, during life, had presented the clinical appearances familiar to veterinarians as "kinked back" and "out in the stifles," with, in addition, manifest paralysis of the hind legs, indicated by knuckling over at the fetlock joint. I made reference to other diseases whose features are fairly well known, *e.g.*, "shivering" and "stringhalt," and suggested their possible analogues in the human subject. The interest shown in the paper by leading veterinarians has led me to a further consideration of the subject, with special reference to the case of the hackney shortly referred to in my former paper. Before entering on this, however, I would like to correct an erroneous impression that appears to have been conveyed to some readers as to the relationship of the different diseases mentioned. For instance, one correspondent expresses the opinion, arrived at from a study of that paper in conjunction with his personal clinical experience, that the different diseases, "kinked back," "stringhalt," and "shivering," are to be regarded as different stages of one disease. This is an erroneous deduction. The conditions are quite distinct clinically, and in all probability are equally distinct in their pathology. It is true that two of these conditions may be present in one animal at the same time; indeed, this is not to be wondered at when we have regard to the probable nature of the diseased process. But an animal affected with "kinked back" may at the time of its death exhibit none of the symptoms of the other forms of paralysis, and *vice versâ*. We will avoid falling into error if we remember that each of these clinical conditions doubtless has a perfectly distinct morbid anatomy. and that a fair idea of the site of the disease may usually be obtained by careful examination of the clinical features of each case. At the close of this paper I have appended a short note of the method of examination that appears to me to be best suited for the investigation of these cases.

On examination I found a well-bred, well-nourished hackney, 14½ hands, *aet.* eighteen months. A cursory glance revealed nothing abnormal. When viewed from a distance he appeared to walk, trot, and canter in good style, but a closer examination revealed serious defects. There was

visible marked irregularity and want of co-ordination in the movement of the hind limbs, with obvious paresis of the flexors of the toes, indicated by knuckling over at the fetlock joints. The feet were lifted slowly and deliberately, the whole limb was moved forward stiffly, the flexion at the hock joints was much less than normal. When endeavours were made to back him this movement was found to be impossible, and he could easily have been upset if the attempt had been persisted in. His attempts at this movement showed marked misdirection of the feet, the foot being at one time moved against its fellow or even across it, and at another time further out from the belly than normally. He could not be turned in a narrow radius, an attempt to do so revealing the characteristic condition of "kinked back," and the rapid performance of this movement would also readily have brought him to the ground. There was also marked paresis in the fore limbs, indicated by frequent tripping, especially when going up an incline. All these symptoms became more evident as the result of the frequent tests applied.

The defects were most pronounced when the animal was made to trot or canter over a part of the paddock where the ground was uneven; he was then almost continually "recovering himself" more or less awkwardly from his mistakes. While all these symptoms were distinctly visible to a trained observer, I may mention, in proof of the degree of care required in the examination of these cases, that a hackney expert who was present during my examination detected little abnormal in the appearance or going of the animal. This fact is particularly interesting in view of the pathological features to be described later. A consideration of the case led me to conclude that there was a lesion of the cord most marked in the posterior columns, of a nature akin to Friedreich's ataxia in the human subject. I made arrangements for a further examination, including a histological examination of the blood, but the animal was unfortunately destroyed before these were effected.

I obtained the following history from the owner:—The sire and dam are alive and well and in active work. No facts of importance have been obtained regarding them. The colt was wintered in the country, grazing all day and under cover at night. He got two feeds of oats daily and a feed of oat straw at night. It was observed that he did not thrive properly, he "wintered badly." This régime continued for six months, and in the spring he was brought into Edinburgh, walking the distance of 17 miles. Nothing was noticed at this time except that he was in very poor condition. He was now put into a good grass park and received no extra feeding. His condition immediately improved. Within a week the owner observed a pronounced change in his appearance; not only he, but others also, were much impressed by the rapidity of the improvement. The colt continued to make good progress, but in the course of the summer the owner's attention was attracted by an awkwardness in his movements. As this persisted, a surgeon was called in, and he attributed the condition to some previous injury. The owner states that about this time there was a distinct swelling in the back, in the lumbar region, but exact information on this is awanting. The surgeon who saw the animal can give no positive information on this head. The condition remained unchanged, so far as observed, until the animal came under my notice in September. It is worthy of remark that a colt which was wintered alongside of this one, and appeared to thrive all right, died shortly after from the effects of castration, the operation being

performed under favourable circumstances by a man of special experience. The cause of death was in all probability septicæmia, and it is possible that the diminished power of resistance to pathogenic organisms was the result of the unphysiological diet which I have described.

The examination was made within eighteen hours of the animal's death. Unfortunately I had been unable to obtain a histological examination of the blood during life, and had not the opportunity of examining the viscera, more especially the gastro-intestinal canal, the kidneys, and the bone marrow in its fresh state. The only points of interest that I determined from the examination of the skeleton were—*a*. The absence of any undue laxity at the sacro-pelvic articulation. This point was specially investigated with the object of determining whether such laxity would account for the readiness with which the position of kinked back is induced : and *b*. The whole bony skeleton was remarkably voluminous and dense. The ribs and vertebræ showed this appearance ; the former on section were red and cancellous. It appeared to me that, after making all due allowance for the fact that the bones of well-bred animals are relatively much denser and heavier than those of a poorly bred stock, the bony system showed a general diffuse sclerosis. I refrain, however, from making a definite assertion on the point. I submitted the bones of the limbs to Professor Bradley of the Veterinary College, but, like myself, he was unprepared to express a decided opinion.

As the osseous system of the horse in the case recorded by MM. Hendrickx and Lienaux, and referred to in my last paper, was described as specially voluminous, the point is well worthy of further careful study.

State of the Cord.—The cord was examined in the upper and middle cervical, the mid and lower dorsal, and a part of the lumbar regions. A few gross changes were observed. Around the cord in the first cervical region there was a considerable extravasation of blood within the dura mater, extending for a distance of about 1½ inches. As the bleeding vessel was not detected, the hæmorrhage was probably of capillary origin. No other gross change was detected in the first examination, but other abnormalities were discovered on a later examination of the formalin hardened cord. Transverse section of the piece of cord from first cervical area revealed a large cavity in the grey matter on one side, involving mainly the posterior cornu. This was soon passed, but a similar though much smaller cavity appeared in the corresponding situation on the other side. There was also a marked depression on the surface of the cord at the exit of one posterior nerve root, on the side in which the main cavity existed. This was apparently due to some antecedent lesion, with resulting contraction of tissue. Plate I. illustrates the naked-eye appearances of the cord at the lower limit of the main cavity just described.

Transverse section of the cord at the level of the fifth cervical showed a bilateral lesion in the posterior part of the cord of the nature of softening in the middle of the posterior cornua. This extended vertically for a distance of half an inch, and appeared to slightly involve the postero-external columns. A similar examination of the lumbar cord revealed at one point an area of softening in the superficial part of the posterior columns. This is well shown in Plate VI.

HISTOLOGICAL EXAMINATION.

Cervical Cord.—Plate I. illustrates some of the features of this part of the cord. This section is taken at the lower limit of the cavity in the grey

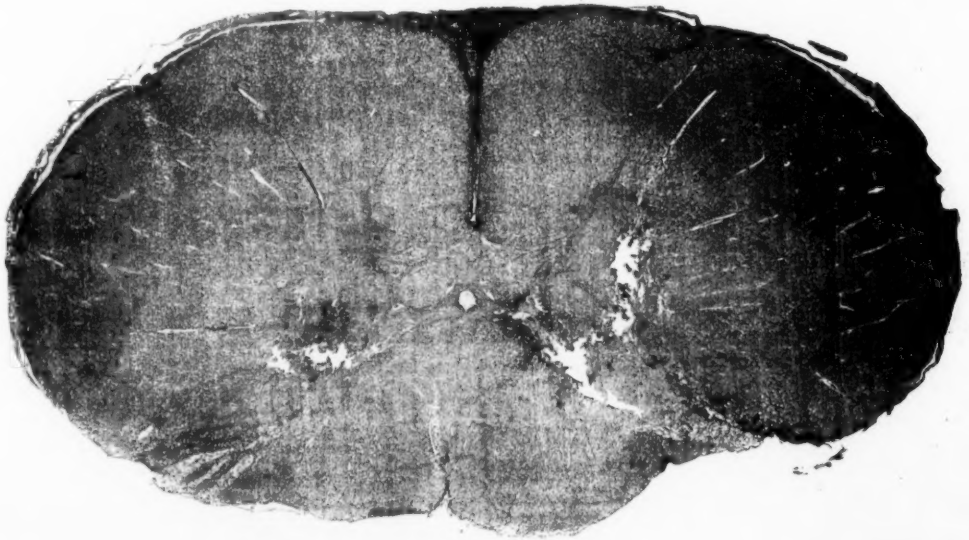

PLATE I.

Ed. Mudv.

Cervical cord. First cervical. Photoxylin section. Hæmatoxylin and eosin. (× 10.)

Note the irregular cavity formation in the grey matter; also the marked depression on the surface at the exit of one posterior nerve root, the result of a previous lesion.

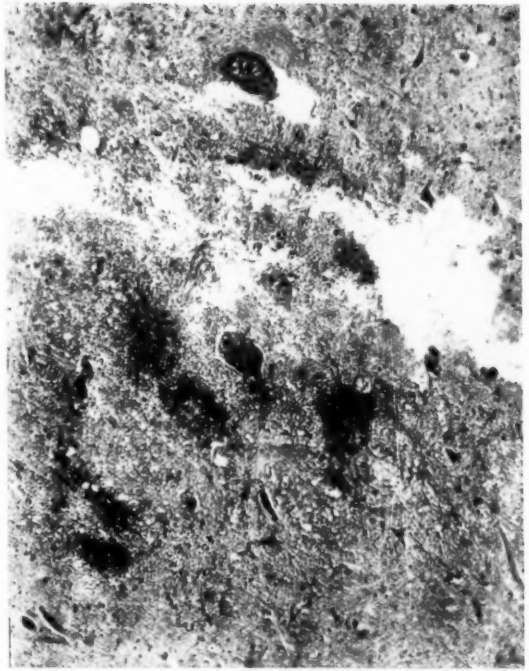

PLATE II. *Ed. Muir.*

High power view of grey matter in Plate I. (× 100.)

The dark areas are recent haemorrhages, which are numerous, and vary in size as shown.

PLATE III. *Ed. Muir.*

Cervical cord. Photoxylin section. Haematoxylin and eosin. (× 55.)

The periphery of one lateral column in which there is considerable degeneration of nerve fibres.

Note—(i.) The pronounced thickening of the vessels.
(ii.) The dilated perivascular lymphatic spaces scattered throughout the field. Note the moniliform arrangement in the near part of the field.
(iii.) The slight increase of the pia.

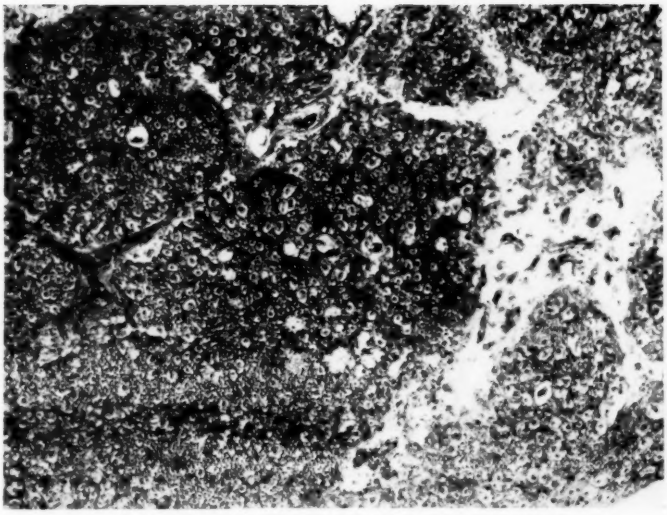

PLATE IV. *Ed. Muir.*

Posterior column of same section as Plate III.

Note the irregular area of atrophic softening in which the remains of markedly thickened vessels are visible. To the left are seen vessels showing pronounced fibroid changes.

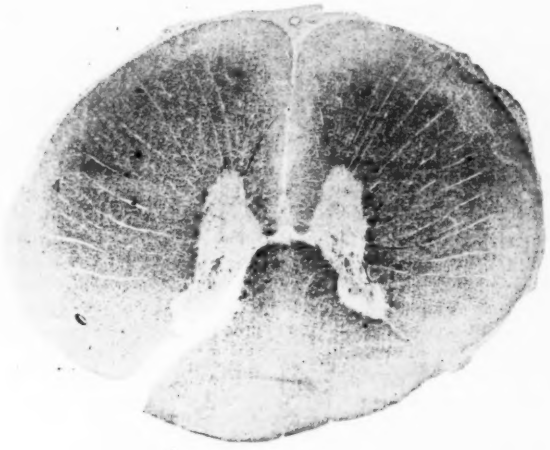

PLATE V. *Ed. Muir.*

Cervical cord. Weigert stain. (× 6.)

Shows extensive degeneration of the nerve fibres, most marked in the posterior columns, and anteriorly along both sides of the septum. It is present, though in less degree, in the lateral columns, especially at the margin of the cord.

[These appearances are best seen if the illustration be held at a distance of two feet.]

PLATE VI.

Ed. Muir.

Lumbar cord. Photoxylin section. Hæmatoxylin and eosin. (× 8.)
Shows an area of acute softening in the superficial part of the posterior columns.

matter referred to under naked-eye characters. Note the size and position of the cavities here present; these are obviously the result of softening from vascular disease. Numerous recent hæmorrhages are present in the grey matter on both sides, more especially on the side with the larger cavity. Some of these hæmorrhages are small and linear, others are large and irregular in shape. On both sides they are most pronounced in the posterior cornua. In a few cases the extravasation is seen in close relationship to a thickened, dilated, and ruptured capillary. The colour and general appearance of these hæmorrhages, and the absence of marked inflammatory reaction around, indicated their recent character. The vascular disease was very pronounced, affecting mainly the capillaries and large vessels, and to a much less degree the veins; the disease was most manifest in relation to the areas of softening. The capillaries were in parts dilated, and their walls were thickened, and occasionally the hæmorrhages were found in relation to ruptured capillaries.

The larger vessels[1] showed thickened walls and diminished lumen, the change being due to a hyaline fibroid thickening. The affection of the larger vessels was, however, less marked here than in a lower part of the cervical cord. The most striking vascular lesion was undoubtedly the capillary one. The pia showed slight thickening, most marked in the postero-lateral regions of the cord. A distinct neuroglial overgrowth was manifest throughout, being most pronounced in the posterior columns and neighbourhood of exit of the posterior nerve roots. The state of the cells in the grey matter was not specially investigated, but in addition to the actual loss of number from actual softening, there appeared to be a slight degree of irregularly distributed atrophy of the cells, both in the anterior and posterior cornua.

For convenience the appearances in the third and fifth cervical areas may be considered together. It should be stated that at different levels the appearances varied in degree. The nerve fibres showed extensive degeneration of all the tracts at the periphery of the cord, the change being more pronounced in the lower cervical region. In this respect it corresponds to the greater amount of vascular diseases in the latter area. In the third cervical region the degeneration was greater in the anterior than in the posterior part of the cord; the reverse held good for the fifth cervical (in Plate V.). The disease of the vessels was very pronounced, and was invariably worse in the regions where degeneration or softening of the nerve structures was most apparent. The arterioles and capillaries were alike involved. Plate III. shows a large number of greatly thickened vessels in the posterior part of the lateral column, at a part where the degeneration of nerve fibres is specially marked. This illustration also shows numerous dilated perivascular spaces throughout the fluid. Plate IV. is a photograph of a part of the posterior column of the same section, showing an area of softening directly produced by the local disease in the vessel. Lesser degrees of this condition can be seen in this and other sections.

Dorsal Cord.—The condition was very similar to that described for the cervical region. The degeneration of nerve fibres was invariably most pronounced in the peripheral part of the cord. The vascular disease was, however, much less pronounced than in the sections of cervical and lumbar cord examined.

[1] For a knowledge of the normal circulation in the cord, &c. the reader is referred to a valuable small work by R. T. Williamson, "Relation of Spinal Diseases to the Lesions and Distribution of Spinal Vessels," 1895.

PLATE VI.

Lumbar cord. Photoxylin section. Hæmatoxylin and eosin. (× 8.)
Shows an area of acute softening in the superficial part of the posterior columns.

Lumbar Cord.—Three different pieces of the lumbar cord were submitted to examination. At one part (Plate VI.) there was an area of softening in the peripheral part of the posterior columns visible as a naked-eye change. The site and nature of this lesion are well indicated in the illustration. The degeneration of the nerve fibres was marked at all the levels examined, the site and nature being similar to that depicted in Plate V. for the cervical cord. The change varied in degree at the different parts of the cord. The disease in the vessels, capillaries, and arteries was pronounced, and of a nature similar to that already described.

The result of the histological examination[1] may be shortly summarised. The lesions were two-fold :

(*a*) *Focal*—areas of softening and hæmorrhages—in the grey and white matter, especially of the posterior cornua and in the posterior columns. These were obviously dependent on vascular disease.

(*b*) *Systemic.* — Marked degeneration of the nerve fibres in the periphery of the cord. This varied in degree at the different levels, being at some parts more pronounced in the anterior, and again in the posterior and lateral regions of the cord. This degeneration was greatest in those areas where the vascular disease was most pronounced.

DIFFERENTIAL DIAGNOSIS.

The following points may be of service in the diagnosis and differential diagnosis of these various affections in the lower animals.

Position of the Limbs.—Any serious defect in the muscular sense will be revealed by closely observing the position of the fore and hind limbs. The limbs may be too wide apart, indicating the necessity of an increased base of support, or the position may be otherwise abnormal. For instance, the hind limbs may be actually crossed, or one may be normal and the other everted and thrown out too far from the body of the animal. A great variety of curious positions will be found if looked for in appropriate cases, a slight alteration in the animal's position sufficing to bring about another unnatural attitude.[2]

Motor Power of the Limbs.—Defects in the flexor group of the muscles will be revealed by tripping in front and knuckling over behind. When either of these are present, attention should be directed to the hock and knee joints, when it may be seen that the degree of flexion of the joint is very appreciably diminished. Attention should then be directed to the manner in which the whole limb is moved forward, when it may be seen that the motion lacks the character of normal muscular action, the movement being more of a swaying character. The manner in which the feet are raised and put down will be referred to immediately. During the act of walking, the observer should notice the length and direction of the stride. At one step it may be too long, the next too short, at one time too much under the middle line of the body, and at another too far removed from it.

Elevation and Depression of the Feet.—In the foregoing remarks we have

[1] As on a former occasion, the histological work of this paper was carried out in the laboratory of the Scottish Asylums, and I am indebted to the Director, Dr. Ford Robertson, for many valuable suggestions.

[2] These will be illustrated in the July number of this Journal.

been dealing with symptoms resulting from a lesion mainly in the grey matter and posterior columns, but when the lesion is primarily in the lateral columns, or has extended to them from an adjacent part of the cord, the picture is different. An element of spasm then characterises the movements. The foot is raised with a jerk and put down with a jerk that is very characteristic. In marked cases an apparent stiffness of the limbs is very pronounced.

Further tests for co-ordination.—The most useful tests are the act of backing, turning sharply in a narrow radius, and trotting on uneven ground. Additional tests consist in covering the head with a cloth, thus making the animal more dependent on his muscular sense alone, when any defect in the latter will be revealed by unsteadiness; in bad cases the animal will fall to the ground.

Reflexes.—Careful inquiry should be directed to the state of the bladder and rectal functions. I have seen it stated that disturbances of these functions do not occur in these chronic affections. I am confident that this is a mistake. I lately saw a farm horse, aged and affected with string-halt, where there was a very definite history of bladder trouble. This animal was observed for months with the object of determining the point, and the foreman on the farm assures me that, since his attention has been drawn to it, he is certain that the animal has not normal control over the urinary flow—there is sometimes retention and sometimes incontinence.

Of the reflexes, other than the organic, perhaps the best test consists in raising a limb, selecting the one affected, and noting the effect (*a*) on the animal's equilibrium, and (*b*) on the adjacent muscles. The latter may pass into a state of clonic spasm, a feature indicative of a lesion of the pyramidal tract. The mere fact that the animal is, as a rule, exceedingly unwilling to lend himself to this experiment suggests the existence of a defect. The reaction of the pupils to light should also be investigated.

It is, perhaps, unnecessary to emphasise the value of the antecedent history in the diagnosis. What is less commonly recognised is the relationship borne by many of these numerous symptoms to a definite disturbance in the system generally, and especially to the digestive tract. This point is of value not only in the diagnosis but in the treatment of these affections.

If the various points outlined are carefully investigated, it will usually be possible to arrive at a fairly accurate opinion as to the site and distribution of the lesion. It will be noticed that no mention has been made of local muscular atrophy nor of disturbances of common sensibility as points of value in diagnosis. These are of very great value when present, but the difficulties attendant on their recognition are considerable, and, as a rule, we must rely on other evidence.

TRANSPORT OF HORSES BY SEA.

BY W. OWEN WILLIAMS, F.R.C.V.S., LATE VETERINARY ADVISER BRITISH REMOUNT COMMISSION, NEW ORLEANS.

I PURPOSE describing very briefly some of the work which has to be done in connection with the preparation of a ship for use as a "horse transport," and I do so with the intention of showing how necessary it is that such work is really part of the work of an army veterinary surgeon and of no

other man, as, in my humble opinion, no one is so well fitted to perform the work as the veterinary surgeon of to-day.

Perhaps I might mention that among the subjects taught at Veterinary Colleges, and examined in by the Examiners of the Royal College of Veterinary Surgeons, are included stable management, hygiene, and dietetics.

To begin with, the intended transport, which may be a grain boat or an ordinary tramp, or even a passenger and cargo boat, should be carefully inspected from stem to stern and from bridge to bilge, and at a time when she is empty, at anchor, and, if possible, when there is plenty of light but not too much wind blowing.

Before commencing this inspection copies of the plans of the ship should be procured, or rough plans made, and on these, which should be in triplicate, can be marked the places where stalls or pens may be fitted and where sick-boxes have to be built, such as on the hatches and on the poop and near the bridge.

As one proceeds notes must be taken of all the places, such as shafts, port-holes, ventilators, and doors which give entrance or exit to good and foul airs, noting whether such currents are in action, for if there be no currents through these places artificial aid must be introduced in the shape of fans driven by machinery. It must be remembered that good ventilation is of the utmost importance on board a ship, and must be efficient not only when she is at sea and in a head wind, or having a wind blowing on her quarter, but also when she is running before a fair wind or when lying at anchor.

In addition to the fans, shafts must be constructed of wood to conduct the air to the remotest corners of all parts of the ship where horses have to stand. These shafts should have slides or revolving doors in them which can be fixed to regulate the amount of air passing through them, and also to cause alternations in currents.

Wind-sails must also be provided, twenty to thirty in number, and in addition to them should be made sleeves of canvas with hoops in them, which may be attached to the lower ends of the wind-sails, and so used for flushing the holds and other parts. Wind-scoops of galvanised iron should be made to fit each port-hole, and as many doors as possible with safety should be left open.

The next proceeding is to find out what her water-tanks' capacity is, and calculate how much fresh water she can carry without having to condense, also note how much she can condense per day.

As the tanks' capacity is usually given in tons, it is usual to reckon that each animal must have an allowance of 1-28th of a ton or 8 gallons per day ; so that one must multiply the number of animals by the approximate number of days on the voyage, making full allowance for delays owing to head winds, storms, &c., and dividing that sum by 28 gives the number of tons of fresh water that must be taken on board.

It may happen, however, that the transport has not sufficiency of tanks to carry the full quantity of water, and in such a case it will be necessary to condense.

Condensing should be commenced early on the voyage, and the chief engineer should have no difficulty in using say one-sixth of No. 1 tank, and then filling up with condensed,—and passing on to No. 2 tank, use say one-fifth if necessary, and fill up with condensed. If this be done with the

largest tanks there should be no difficulty in obtaining a sufficiency of water for a long voyage,—none of which water will be in greater proportion than one of condensed to four of pure water.

Arrangements must then be made as to the placing of at least one hydrant in each horse compartment, and on the main deck, on which there may be several hundred horses in three or four lines, then numerous hydrants must be placed. In some of the smaller holds perhaps only one or two may be needed.

Special precaution must be taken that no waste occur, as that may result in terrible disaster.

The next thing will be to see that a pharmacy is erected in a convenient part of the ship, so that medicine can be obtained without much trouble,—the neighbourhood of the bridge is most suitable. The pharmacy should be large, so as to store *all* the drugs, and well lighted night and day, fitted with a stout door and a good lock to it.

As regards drugs, that is a matter of choice, but one thing I would point out, and that is, take all drugs as far as possible in such a form so that they can be easily administered, say by subcutaneous injection or in food or drinking water, as it is often a difficult matter to give animals drenches when on board a rolling ship, or when they happen to be standing 'tween decks, which is usually not sufficiently high to enable one to get the horse's head high enough up.

There are many other things of great importance—such as the inspection of hay, corn, bran, &c. prior to its being placed on board—in connection with the transport of animals by sea, but I have purposely only mentioned a few of the preliminary ones, so as to indicate how very necessary it is that a skilled person, and particularly a veterinary surgeon, should be at the head of such a Department.

REMARKS ON LAMENESS.

BY E. WALLIS HOARE, F.R.C.V.S.

(*Continued from page* 267.)

THE diagnosis of lameness arising from ringbone is sometimes very easy; at other times, when the exostosis is not developed, the true cause of the lameness may be overlooked at the time. Injury to the pyramidal process of the os pedis causes very severe lameness; the diagnosis is not easy; while fracture of this part may be incurable, and is accompanied by acute pain and inability to rest any weight on the leg.

There is heat around the coronet and tenderness in front of the latter, but a very careful examination of the foot is necessary in order to avoid falling into error.

Lameness in a hind leg offers as much difficulty in diagnosis as that in the fore extremity.

Various diagnostic symptoms are laid down by text-books, but they cannot be relied on, and every case must be judged on its merits.

Most of us will agree that the hock is the most frequent seat of lameness in the hind extremity, and also that incipient bone-spavin is often difficult to diagnose.

Hocks have been fixed on more occasions than one for spavin lameness, but after-events proved that the diagnosis was incorrect, and that the cause of the lameness was higher up in the limb.

Still the opposite is more frequently the case, and very careful discrimination is necessary in forming an opinion.

Cases are met with in which a well-developed bone-spavin is present, and in addition there may be wasting of the muscles of the hip; the latter may be the result of long-continued hock lameness.

We have one specimen in which the cuneiforme magnum, the cuneiforme medium, and the cuboid were anchylosed; the cuneiforme parvum was normal, there was no perceptible enlargement, and the horse was lame from time to time, but after firing was fit for carting work.

In another specimen from a horse that I drove for a long period there was complete anchylosis of every bone in the hock, the external enlargement was very extensive, and although stiff in his action the animal did a lot of work.

In forming an opinion as to the hock being the seat of lameness we rely on the history of the case and on the want of flexion in this joint; of course a perceptible enlargement is a great help to diagnosis. There may be a great difference of opinion between practitioners as to whether a horse is lame in the hock or in the hip.

In some cases of hip lameness the horse may improve after exercise, and diagnosis may be difficult.

It is often impossible to decide which opinion is correct, as if the horse goes sound no one is anything the wiser; and the probabilities are that the rest given after firing the hock or blistering the hip was in reality the real curative agent. Too much credit as a rule is given to counter-irritation and too little to the recuperative powers of Nature. Perhaps, from a business point of view, it is preferable that our clients should think otherwise.

The run at grass often succeeds when the wisdom of a multitude of counsellors has failed; in fact, it is one of the best ways of getting out of a difficulty.

"Fads" in the diagnosis of lameness are not uncommon.

Some blurt out a diagnosis of navicular disease, as if they carried a Rontgen Rays apparatus in their orbits.

Occasionally, in order to render their diagnosis secure, they advise and perform neurotomy, and get the credit of cleverness when in reality navicular disease was not present. In consultations one hears occasionally of some very interesting seats of lameness.

Of course the consultant endeavours to discover something out of the common; it is a feather in his cap, and his opinion is believed; whereas if he agreed with the attending practitioner he would be classed as the ordinary or garden variety.

We are sceptical as to the marvellous gift in the diagnosis of lameness that some individuals are supposed to be blessed with.

No doubt a large experience in the diagnosis and treatment of lameness will enable a practitioner to possess marked advantages in this respect over one whose experience is limited, but still even the oldest and keenest observers make mistakes, and are not to be regarded as infallible.

When we are told it was possible that a diagnosis of the leg that a horse was lame in and the seat of the lameness could be arrived at by

hearing his footsteps, we are inclined to think that this statement was only used in a metaphorical sense, or that a system of guess-work was indulged in. Or, on the other hand, we in the present day must be very deficient in the art of diagnosis, because, even with the greatest care and observation, we acknowledge that we often give erroneous opinions.

Still the teachings of failure cannot be ignored, and if we are honest, the older we grow and the more experience we acquire will lead us to ponder on the matter, and to think of what we have yet to learn on the subject of lameness. A great drawback to increasing our knowledge of the subject is the difficulty, if not impossibility, of obtaining post-mortem examinations of obscure cases of lameness. Such cases pass out of our hands and are lost sight of, consequently we are not enabled to learn anything practical therefrom.

Intermittent lameness is an important subject, especially with reference to the examination of horses as to soundness. The majority of such cases suffer from an obscure form of lameness in one or both feet, and they have intervals of freedom from lameness, during which even the most careful observer will pass them as sound.

It is surprising to observe the effect of a little treatment in many of these cases ; poultices to the feet, a blister to the coronets, and the feet left to grow as much as possible, will often render them temporarily sound ; but as a rule one attack succeeds another, and chronic lameness is the result.

Over-grown feet should always be regarded with suspicion, and should put us on our guard, especially if the animal is a good-looking one, and the property of a dealer ; the latter may be a professional, or one of the gentleman variety, for both are equally clever in disposing of a "crock."

Pointing of one or both feet may be present in these cases without any lameness, and is a symptom to be carefully looked for in the examination as to soundness, as in almost every instance it indicates intermittent lameness.

Rheumatism is responsible for a good number of these cases of intermittent lameness,—at least that is the usually accepted opinion. We cannot vouch as to its accuracy, but it is a very convenient way of expressing ourselves on a subject that we are ignorant about. As we are expected by many clients to be judges of futurity on the subject of lameness, it is clear that these intermittent cases may, and often do, give rise to a lot of anxiety and trouble.

Sir Fretful Plagiary may be very irate if his horse, only purchased about a week, happens to go lame, after being examined and certified sound.

He naturally flies to another veterinary surgeon, who assures him in the most emphatic manner that the case is one of long standing, indeed he may declare that he personally knew the animal, and he was a confirmed "crock."

Then arises the usual threats and denunciations by the client,which usually end in a "battle of smoke." Unfortunately they occasionally do take legal proceedings, and the expert evidence given does not redound to the credit of the witnesses.

The public should clearly understand that lameness may not be apparent at the time of examination, that it may appear without any appreciable cause, that no one can honestly tell the exact duration of such lameness, however clever they may be at guess-work.

One veterinary surgeon is not specially gifted in these respects over another ; all that can be done is to thoroughly test the horse by severe

exertion, let him stand for an hour, watch him as he stands, and if he goes sound after this, we can do no more.

Some practitioners are regarded as paragons of perfection in the question of lameness, and their opinion is supposed to put all others in the shade. They are even permitted to err with impunity at times, while their less favoured brethren would be severely censured under the same circumstances.

It was a wise man who wrote with reference to reputation that it was "oft won without merit, and lost without deserving."

BRONCHO-PNEUMONIA IN SUCKING CALVES.

A SPECIFIC form of broncho-pneumonia in sucking calves, which is very prevalent in the valley of the Loire, is recognised and described in text-books on veterinary medicine by French veterinarians. M. G. Moussu differentiates the disease into two classes, based on the inducing causes. From difficulty in calving the young animal during birth is subjected to pressure on the umbilical cord and chest over the region of the heart, and respiration is provoked by reflex nervous action. If the head has not been born, the result is that a portion of the fœtal fluids are likely to be drawn into the lungs, and if these fluids have become contaminated, either naturally or in the process of obstetric manipulation, broncho-pneumonia is certain to supervene.

The second form of broncho-pneumonia attacks even the most vigorous calves that are well housed and cared for during the first weeks of life, and is a sequel to diarrhœa. It is always dangerous and very fatal, and usually does not show itself until the diarrhœa lessens or stops. It runs its course rapidly, and in such cases there are frequently other chest complications, such as pleurisy and pericarditis. M. Moussu considers this form to be primarily due to auto-infection from the intestines, the infective germs passing with the blood current to the lungs, and giving rise to pneumonia, with pleurisy, pericarditis, and heart complications eventually following.

In a subject on which a post-mortem demonstration was given by M. Moussu to his class of students, the appearances of the body were thus described :—

"Although the diarrhœa was very slight, the membrane lining the small intestine was inflamed, red, and peeling off in shreds, being more altered in appearance than it would be in a case of inflammation of the bowels with rapid death. The right lung, particularly its front tube and lower border, was chiefly implicated, and three abscesses the size of a nut were present. The left lung was congested and affected with bronchitis, but not pneumonia. There were multiple adhesions between the pleura on the right side of the chest, but on the left it was normal. There was intense pericarditis, but the pericardium was not thickened."

The symptoms are :—Difficulty in breathing, especially on inspiration, and this becomes more marked if the calf is made to move. The respirations are from 50 to 60 per minute, and the temperature varies from 38·5 to 39° centigrade. There is a continued and painful cough with profuse discharge from the nose, and if the sides are percussed pain is caused. In

the case demonstrated by M. Moussu, on auscultation the respiratory murmur was found to be increased at the upper third of the chest with mucus and crepitant pulse over the middle and lower. There was a whistling inspiration over the front tube of the right lung.

The sounds of the heart were well marked and as distinct on the right side as the left. The calf was very emaciated and in bad condition. M. Moussu is of opinion that the disease is of septic origin, and proposes to designate it "Intestinal Broncho-Pneumonia." He states that cases are common in France amongst calves that have never been out of the cowshed since birth and have never been exposed to cold; also that at times it assumes an epidemic form, particularly in herds where diarrhœa is common. Treatment is not very successful, and M. Moussu recommends sanitary measures with careful feeding rather than medicinal treatment. He particularly lays stress on the importance of carefully attending to and applying an antiseptic dressing to the umbilical cord as soon after birth as possible. The original paper by M. Moussu is published in *Recueil de Médicine Vétérinaire* for 15th April 1901.

JOSHUA A. NUNN,
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PECULIAR CRYPTORCHID CASE.

BY T. M. INGLIS, M.R.C.V.S., FORFAR.

Case I.—As I have for a number of years made a special practice of operating on horses of the cryptorchid nature, I have had presented to me many peculiar abnormalities.

I have found the retained testicle in nearly every conceivable shape and position, and have always been fortunate in finding a testicle of some kind.

It is quite common to find a very large cyst, which has to be ruptured before it can be removed, also in the form of a very small bony substance, about the size of a walnut and quite as hard. One can never tell where the retained organ is to be found, or in what shape. Some time ago I had sent me for operation a two-year-old (Clydesdale) single "Rigling" with a very large and distended scrotum on the one side.

It was so tense that no substance could be felt within.

After casting the animal I found on opening the scrotum a large quantity of fluid, with a peculiar-shaped sac within it.

After removing the fluid I endeavoured to trace the origin of this abnormal presentation, and found with difficulty that it continued right through the inguinal canal and nearly filling it.

As it was impossible to get this body into the abdomen owing to its size, I tapped it with a small trocar and canula, and drew off a good quantity of yellow, flaky fluid smelling strongly of urine.

I was for a few minutes rather puzzled, but, after suturing the small opening, I had this body pushed within the abdominal cavity.

I then introduced my hand, and found that I had the urinary bladder to deal with.

I do not remember having seen any record of such a form of *inguinal hernia*, and consider the case a unique one.

Owing to the altered condition of the bladder, I am inclined to think this animal must have been born with the displacement.

After I replaced the bladder I found the retained testicle, and quite normal in shape.

A few days after the operation the bladder had again found its way through the canal (being extremely lengthened in shape), and became strangulated; consequently I had the patient destroyed.

TREATMENT OF LARYNGITIS WITH THE ASSISTANCE OF LEECHES.

Case II.—Some time ago I had under treatment a very bad case of *laryngitis.*

The animal was a valuable one, and had the disease in its worst form. I tried the usual treatment, and after a few days, fearing suffocation, proposed tracheotomy.

The owner would not hear of it, and, of course, we had rather a heated discussion.

I, however, was forced to leave the animal to take his chance, but my mind was set on some other treatment of relief.

The skin of the throat, with blistering and fomentations, was quite free of hair, and it struck me that some form of local bleeding would do no harm.

After consideration I made up my mind to get half a dozen *leeches.* I pricked two places over the parotid region on both sides, and fastened a leech to each.

After these dropped off I took the other two and placed them under the larynx in the same way. The animal at this time was making a fearful noise, but after an hour and a half he became quieter and seemed to have got some relief.

From that time he continued to improve, and made a good recovery. The case may have been at the turning-point when the leeches were applied, but I shall not hesitate to try them again.

BACTERIOLOGY—"ACID-FAST" BACILLI.

BY D. A. WELSH, M.A., M.D., PATHOLOGIST, ROYAL INFIRMARY, EDINBURGH.

IT is a matter of common knowledge that the identification of a specific microbe from its morphological characters and staining reactions alone is often impossible—that, indeed, in the majority of bacteria a microscopic examination can reveal little more than the class to which the organism belongs. But ever since bacteriology became a recognised science, it has hitherto been considered that there were certain bacteria the recognition of which under the microscope could be effected beyond all reasonable doubt. With advancing knowledge, however, the necessity for greater caution in interpreting the results of microscopic investigations has become more and more apparent. The number of known duplicate or "pseudo" forms has greatly increased, and it is not too much to say that there is hardly any pathogenic microbe whose microscopical characters may not be simulated by some allied or non-pathogenic variety. One has only to think of the many forms that may be mistaken for the gonococcus, for the bacillus of diphtheria, or for the spirillum of cholera, to appreciate the increasing difficulty and uncertainty of a microscopical diagnosis.

But until the last year or two it was generally believed that in the

bacillus of tuberculosis, at least, there was an organism whose staining reactions and microscopical characters could be implicitly relied upon to distinguish it from other bacteria. In 1899 Bulloch, who has devoted much attention to this subject, wrote: "Until quite recently the tubercle bacillus has remained unchallenged, and the diagnosis of tubercle from the microscopic examination and the recognition of rods which remain stained after decolorisation by acids, has been accepted unequivocally. The existence of bacilli which when once stained were "fast" to acids, was practically unknown, if we except *Bacillus lepræ* and *Bacillus smegmatis*. In order to distinguish the tubercle of Koch more certainly, it has been customary to treat the stained preparations with acid and then alcohol, this severe process having little effect on the bacillus, while almost all others are decolorised. And it was universally accepted that a slender bacillus which retained its stain after this severe technical procedure was the genuine *Bacillus tuberculosis*. It would now appear, however, that there are quite a number of bacilli which are as "fast" to acids and alcohol as the genuine tubercle bacillus, and it must be acknowledged that this discovery has given a rude shake to the belief that the microscopic examination of the tubercle bacillus is in itself sufficient to establish a diagnosis of tuberculosis." The practical importance of these observations is obvious, and it may be noted that in the forthcoming British Congress on Tuberculosis one of the subjects for discussion includes the relations of the *Bacillus tuberculosis* to other "acid-fast" bacilli.

The term "acid-fast," as applied to bacilli, is based on the discovery by Ehrlich of the fact that the tubercle bacillus when once stained resists decolorisation by strongly acid solutions and by alcohol—that, in other words, the stained bacillus is "fast" to acids and to alcohol. This, indeed, is the basis of the well-known Ziehl-Neelsen mode of staining, which has practically superseded all other methods. It has, of course, long been known that the bacillus of leprosy possessed the same "acid-fast" peculiarity, though in a less degree, and isolated instances of other bacilli with similar staining reactions have from time to time been recorded. But within the last few years a large number of "acid-fast" organisms have been recognised, most of them occurring in such circumstances as rendered them extremely liable to be mistaken for tubercle bacilli. In this brief summary of the leading facts relating to the known forms of "acid-fast" bacilli it will be convenient to classify them roughly as follows:—

1. "*Acid-fast*" *bacilli found in the tissues, secretions, or discharges of the human subject.*

In addition to the bacilli of tuberculosis and of leprosy these include other forms obtained from—

(*a*) The respiratory tract (Fraenkel).
(*b*) The intestinal tract.
(*c*) The urinary tract (*e.g.* smegma bacillus).

2. "*Acid-fast*" *bacilli found in domestic animals, and in animal food-products*:

e.g. (*a*) In the udders and teats of cows (Murray Cowie).
(*b*) In milk (*ibidem*).
(*c*) In butter (Rabinowitsch, Petri, &c.).
(*d*) In cow-dung (Moeller).
(*e*) In the smegma of various animals (Murray Cowie).

3. "*Acid-fast*" *bacilli found in a saprophytic condition*:
e.g. (*a*) In sewage (Houston).
(*b*) On certain grasses (Moeller).

1. Apart from tuberculosis and leprosy, "acid-fast" bacilli have been observed in various conditions in man. In gangrene of the lungs the occurrence or organisms resembling but not identical with tubercle bacilli was described in 1898 by Fraenkel and by Pappenheim, and in 1900 by Rabinowitsch. In 1899 Moeller observed the presence of acid-resisting bacilli in the mouth and sputum of non-tuberculous patients—an occurrence said to have been previously noted by Zahn.

In the intestinal contents similar "acid-fast" bacilli, believed to be distinct from tubercle bacilli, have been mentioned by various observers. A case of special interest was recorded in 1899 by Dietrich, who found "acid-fast" bacilli resembling but quite distinct from tubercle bacilli in a suppurating cyst of the ovary which had ruptured into the intestine—a circumstance which during the life of the patient had led to an erroneous diagnosis of tubercular peritonitis.

In the urinary tract the best-known organism endowed with acid-resisting properties is the smegma bacillus, which may of course be found in urine, and thus on a cursory examination come to be mistaken for tubercle. First described in 1885 by Alvarez and Tavel, this bacillus has been frequently noted, and in 1897 was said to have been cultivated by Laser and Czaplewski. Conflicting statements have been published as to its morphological and tinctorial resemblances to the bacillus of tuberculosis—the usual inference being that the similarity is very close. But, as Muir and Ritchie pointed out in 1899, a careful examination reveals distinct differences in both respects. In form this organism is usually distinctly shorter than the tubercle bacillus, and in its staining reactions it again differs by being readily decolorised on exposure to alcohol for one minute after the usual treatment with sulphuric acid. It is said to be quite innocuous when injected into animals.

In regard to the "acid-fast" bacilli occurring in man it may therefore be said that, with the exception of the organisms of tuberculosis and of leprosy, they have not been thoroughly studied. In most instances their mere presence is all that has been noted, and the smegma bacillus in particular has not yet been satisfactorily investigated.

2. In various domestic animals, and in some food stuffs derived from them, numerous examples of "acid-fast" bacilli have lately been described. In 1900 Murray Cowie published a preliminary report in which he stated that in films prepared from scrapings of the udders and teats of healthy cows he had demonstrated the presence of acid-resisting bacilli which were not tubercle bacilli. In all eight cows were examined, with positive results in five and negative in three. On examining the sediment obtained by centrifugalising the milk from eight cases, the same author found that each specimen showed many acid-resisting bacilli, some of which might easily be mistaken for the tubercle bacillus. The results of his experiments on the cultivation and inoculation of these bacilli have not yet been published.

In butter the presence of "acid-fast" bacilli distinct from those of tubercle has been detected by many different observers, some of whom have been successful in obtaining pure cultures and in producing granulomata after inoculation. One of the first to make a systematic examination of various samples of butter was Rabinowitsch, who in 1897 isolated an

"acid-fast" bacillus which was capable of growing in all ordinary media, thus presenting a marked contrast to tubercle. Intra-peritoneal inoculation of guinea-pigs with butter containing these bacilli gave rise to nodular overgrowths, which to some extent resembled a tubercular infiltration. Under the microscope, however, no caseation or giant-cell formation was observed. Rabbits and mice appeared to be immune. Two years later Grassberger published some observations which materially supported these results. He introduced samples of market butter into the peritoneal sac of guinea-pigs, and in half the animals inoculated he found similar tissue changes. In the nodules produced there were numbers of acid-resisting bacilli which he was able to cultivate in a pure condition. Meantime Obermüller had declared that in each of fourteen samples of butter examined he had found actual tubercle bacilli. This statement, which one author aptly terms "disquieting," was adversely criticised by Petri, who found acid-resisting bacilli similar to the butter-bacillus described and isolated by Rabinowitsch.

During the years 1898-99 further contributions to this important question were supplied by Hormann and Morgenroth, Korn, Herbert, Ascher, Weissenfeld, and others. While there was very considerable variation in detail, the main points established by their results were that "acid-fast" bacilli may frequently be found in butter; that in some samples tubercle bacilli were apparently present, whereas in others the bacilli obtained resembled those of tubercle in form and staining, but differed in cultural characters and in pathogenic properties. Commenting upon these statements regarding the butter-bacillus, Bulloch says: "The chief 'acid-fast' tubercle-like bacilli are evidently very widely distributed. . . . It is quite possible that articles of diet, especially those derived from animals, may become contaminated, and lead to an erroneous diagnosis of tubercle. Judging from the conflicting accounts of the examination of butter by Petri, Obermüller, Korn, Hormann and Morgenroth, and Lydia Rabinowitsch, this would appear to have already taken place."

Several observations have been recorded of the presence in animal fæces of bacilli which resist decolorisation by strong acids, and of these the most notable are those of Moeller, who succeeded in isolating and cultivating an "acid-fast" bacillus from cow-dung. In its cultural and parasitic behaviour it presents certain minor differences both from the tubercle bacillus and also from other acid-fast organisms obtained by the same author from grasses. Lubarsch, Kretz, and others have confirmed the essential accuracy of Moeller's work.

Quite recently Murray Cowie has undertaken a bacteriological examination of the smegma of various animals, and demonstrated the fact that acid-resisting bacilli occur in many of them, *e.g.*, horse, cow, dog, guinea-pig, and white rat. In the cat and rabbit no such organisms were detected. He believes that these bacilli are of different species and belong to a group of organisms having common staining properties.

Since "acid-fast" bacilli have been shown not infrequently to occur on the udders and teats of healthy cows, in the excrement of horses and of cattle, and on the genital organs of various domestic animals, it is not at all surprising that they should occasionally also be found in milk and in butter. It is even possible to understand that the flesh of perfectly healthy animals may readily receive such organisms on its surface where, since they are known to grow vigorously on artificial media, they would abundantly flourish. The

economic significance of these results is very considerable, and the medico-legal aspects are of the utmost importance in view of the diagnosis of tubercle bacilli in milk, in butter, and on meat exposed for sale. Too often all that is done is to prepare microscopic films, and to stain them according to some routine method for tubercle bacilli. The inadequacy of such a restricted examination is obvious. Much hardship may indeed be inflicted on perfectly innocent persons when prosecuted for selling food which on such insufficient grounds is suspected to be contaminated with tubercle bacilli. Yet the fact must not be overlooked that, though many of these acid-fast non-tuberculous bacilli appear to be quite innocuous, the majority of those examined produce in animals definite pathological effects which in a remarkable manner simulate the lesions of tuberculosis. So far, however, no lesions are known to have been produced by them in man, and some of the lower animals which are highly susceptible to tubercle appear to be immune to the action of these bacilli.

3. That similar "acid-fast" bacilli should also occur in a saprophytic condition is a fact of great interest. In the Reports of the London County Council on the bacterial treatment of crude sewage, Houston states (1) that in crude sewage, in bacterial coke beds, and in the effluents from bacterial beds, there are certain bacteria which, after being stained with hot carbol fuchsin, resist decolorisation with 33 per cent. nitric acid; (2) that some of these "acid-fast" bacteria cannot with certainty be morphologically distinguished from the tubercle bacillus; (3) that experiments on animals were negative with one exception, in which case the animal died of true tuberculosis.

Of still greater interest, however, are the discoveries by Moeller of "acid-fast" bacilli on certain grasses—one of which he named the Timothy Grass Bacillus, or Grass Bacillus I., and another the Grass Bacillus II. The former was first isolated from infusions of timothy grass, and has since been found in other grasses, all of which grasses are said to be widely distributed in temperate climates and extensively used for feeding cattle. Both Moeller and Lubarsch have investigated this organism with great care, and find that in most particulars it bears a remarkably close resemblance to the tubercle bacillus. In staining reactions the timothy grass bacillus appears to have in its younger forms at least an even greater resistance to decolorisation by acids than the tubercle bacillus. In cultures it has much the same appearance, but a considerably more rapid growth, and intra-peritoneal inoculation of guinea-pigs gives rise to nodular infiltrations which in a remarkable manner simulate true tubercular lesions. The Grass Bacillus II., as its name implies, was also obtained from grasses. While resembling both the tubercle bacillus and the Grass Bacillus I., it presented certain differences from both. The cultural characters were more analogous to those of avian tuberculosis, and the form of the organism in cultivation was extremely variable, sometimes occurring as braching filaments with clubbing of the free extremities. Inoculation of animals led to fatal results with tissue changes closely resembling those found in experimental tuberculosis.

What the significance of those grass bacilli really is cannot at present be said. It has been suggested that they may represent a resting stage in the life-history of the tubercle bacillus, but nothing is definitely known as to that. The striking resemblance which they bear in so many particulars to the tubercle bacillus serves to emphasise the necessity for more stringent precautions in the diagnosis of tuberculosis than those commonly applied.

LITERATURE.

More detailed references will be found in the writings of Bulloch and Murray Cowie, to both of whom I am indebted for much help in preparing this summary, but the following are among the more important publications mentioned in the text:—

1. Ascher, *Zeitschr. f. Hyg.* 1899.
2. Bulloch, *The Practitioner.* Oct. 1899.
3. *Scottish Medical and Surgical Journal,* May 1901.

DISEASES OF FOALS.[1]

BY S. WHARAM, M.R.C.V.S.

Mr. PRESIDENT AND GENTLEMEN—At this time of the year we are often called in to attend foals only a few days old suffering from disease. It is not my intention to consider conditions the result of causes, such as a bad mother, either vicious or without milk, exposure to cold, general neglect, and malformations, &c., as in such cases the owner readily understands the cause, and the foal is not expected to live; but in many instances, where the mare is under the best possible conditions, a valuable animal, and the foal by a first-class horse, disease manifests itself, and the majority of owners are anxious to rear the foal, especially when for some days or weeks the little patient has seemed all right. The most common diseases amenable to treatment are scrofulous ostitis, previous urachus, and with complications diarrhœa, enteritis, constipation, rheumatic arthritis, influenza, and inflammatory affections of special tissues. I have seen several cases of tetanus, but they all terminated fatally.

My remarks are necessarily rambling, as, apart from their hurried preparation and superficial character, I am trying to touch on a number of diseases in a short space, each requiring considerable attention; but what is uppermost in my mind is the creation of a discussion, and I shall be amply repaid for any trouble I have taken if the majority of you say a few words and make up for the conspicuous shortcoming of these notes.

The causes include constitutional debility, with a tendency to indolent inflammatory disease (in some cases hereditary) associated with tubercle, errors in diet affecting the milk and general health of the mare, and specific organisms.

With regard to the pathology of some of these diseases, on scrofulous ostitis Williams says (page 162): "To understand this correctly, it must be remembered that the growth of the bones is very rapid in young animals, and that a large quantity of blood is required in the part in order to supply the nutritive plasma for such growth,—in fact the bones, more particularly their extremities, are in a state of healthy congestion. The blood supply must be abundant in quantity and healthy in quality, but in this disease the latter condition is absent; and instead of supplying healthy material for the growth and nourishment of the bones, it conveys a degraded form of albuminoid matter, which is deposited in the structure of the bones and there excites a form of strumous inflammation leading on to caries, the removal

[1] Read at the Spring Meeting of the Yorkshire Veterinary Medical Society on April 25th.

of articular cartilage, and the formation of abscesses in and around the joints, which make their way through the ligaments and synovial membrane, and burst externally by many openings, which communicate with the joint by circuitous sinuses. At the same time tubercular matter is deposited in the cancelli of the bone, which is also found abnormally vascular and much softened. The urachus is also filled with a deposit of this tubercular matter, which, by preventing the process of adhesion naturally taking place between its walls, allows the escape of urine at the umbilical region."

In cases such as you may imagine from the above treatment is useless, for where you get removal of the articular cartilage and caries permanent lameness would result if the animal lived. But are some of those conditions cases of tuberculosis, caused by the bacillus tuberculosis? There is a close relation between scrofulous and tuberculous lesions; in some instances you have an enlarged joint with considerable infiltration and accumulation of inflammatory products causing lameness, which slowly but gradually becomes absorbed; but each case varies considerably and different parts are affected, and in every affected tissue I have examined the inflammation has been of that nature which leads to retrogressive changes such as we associate with tubercle.

I have known several instances on particular farms where they were unable to raise either foals or calves, but if removed to another farm, immediately after or before foaling, the foal lived, and was reared without difficulty, and although constitutional debility plays an important part, the presence of specific organisms, constituting an infected area, is, I believe, the most important factor in producing this disease.

Perhaps more important to us as practitioners is what treatment to adopt in these cases. As a preventive I should suggest that the foaling boxes be thoroughly cleansed and disinfected, and not communicating with mistals or folds occupied by horned cattle, allowing plenty of light and fresh air. The condition of the mother in all cases requires attention; she should be liberally fed and not have too much work, and care should be taken to keep her in general good health. In scrofulous and all debilitating diseases "Fellow's syrup," "Mellin's food," and like preparations are exceedingly useful, mixed with the mare's milk or given with diluted cow's milk previously boiled. The patient should be frequently assisted to suckle during the night as well as day.

In pervious urachus an operation is sometimes required; this consists of placing a ligature, suture, or clam round the umbilical cord, but in all cases I delay the operation and try painting the cord with tinct. ferri perchlor. fort., and dusting it with pulv. boracic acid or iodoform several times a day, with very favourable results. The too early suturing of the cord appears to cause pain and considerable swelling around the umbilicus, and seems to precipitate the swelling of joints and general weakness of the patient. This is no doubt due to the absorption of infective matter, and in the majority of instances something has been tied on the cord by the attendant, and if not causing any inconvenience it is not advisable to remove it.

In diarrhœa a dose of castor oil (2 or 3 ounces), followed by small doses of dried extract of malt in the mare's milk two or three times a day, is very beneficial; in diarrhœa, when the mare and foal are out at grass, I have found the malt extract excellent. Constipation, causing considerable straining, is relieved by injections of oil and water, in the more obstinate

cases castor oil should be administered. A change in the mare's diet, allowing plenty of green food, is frequently followed by good results.

Rheumatic arthritis.—There is some difficulty in the diagnosis of this affection, but it is usually ascribed by the attendant to the mare treading on the foal, although its nature is often revealed by its metastatic action. Salycilate of soda, lime water, and local application of stimulating liniments, and warmth with dry bedding and not too much exercise, often effect a cure.

Influenza contracted from the mother or other animals by infection does not require much treatment. If the mother is healthy and remains so, the foal soon recovers, but if the mother is seriously affected, thereby arresting the proper secretion of milk, the foal requires additional support, and a febrifuge two or three times a day in milk or prepared food.

Colds, pneumonia, bronchitis, enteritis, &c., all require the ordinary treatment that the case suggests. In such young patients as I am dealing with, rapid inflammatory actions soon cause exhaustion and death, and in many cases there is no time for treatment to be of any avail. But even in such cases, if taken at the onset and treated by the application of warm fomentations and subcutaneous injections, or anodyne medicine in small quantities if there are any signs of violent pain, many valuable lives can be saved, and some satisfaction will be obtained for the trouble and expense.

BACTERIOLOGY AND ITS IMPORTANCE TO THE VETERINARY PROFESSION.[1]

BY JOHN DUNSTAN, F.R.C.V.S., ST. MELLION.

(*Illustrated by Lime Light Views.*)

MR. CHAIRMAN AND GENTLEMEN—I feel that in a way I owe you an apology for my appearance here to-day. By way of explanation, I may say that I find a constantly increasing difficulty in persuading our members to bring forward subjects for discussion. It should not be a difficult task to get papers from a society such as this, consisting of over forty members, and including in its ranks many of the most eminent and best-known members of the profession, men who have spent their best years in the pursuit of their calling, and who, from the position they have so rightly attained, are now entitled to rank as authorities.

A little experience of any subject is worth a large amount of theory, consequently it would be an inestimable benefit as well as a great mutual pleasure to us all, as members of the Western Counties Veterinary Medical Association, to sit and listen to the record of the facts of experience of our veteran members. My experience as Honorary Secretary of this Association is, with few exceptions, that it is the last new members to whom one must apply for an essay with any hope of obtaining it. Now, if each member were to lend a hand and contribute at least one paper we should immediately have a stock in hand sufficient to last us for more than thirteen years. I am hoping, gentlemen, that you will take this to heart, and that, at the close of the meeting, there will be such a rush of offers of papers

[1] Read at the Annual Meeting of the Western Counties Veterinary Medical Association, March 28, 1901.

that we shall have to cast lots to decide on the order in which they shall be accepted.

The subject on which I propose to address you to-day is one of ever-increasing importance to the veterinary world, viz., bacteriology, and I may as well tell you at once that I am not going to say anything *original*, and of course I need hardly say that I propose to deal with the subject only in a very superficial manner, drawing your attention to some of the most salient points connected with the vast strides made by the science within the past few years, so that from them we may go on to draw inferences as to what we may expect in the future, and perhaps feel a greater desire to know a little more than we do of what is known of the science to-day.

The first evidence we have of the existence of bacteria is contained in a book written by Athanasius Kircher and published as long ago as 1671, 230 years ago, in which he gives it as his opinion that there were definite micro-organisms to which different diseases were attributable. Kircher had even at that time lenses which magnified 1000 times.

Some four years later a Dutchman, Anthony von Leeuwenhock, noticed in putrid fluids and other media what he described as minute specks of living protoplasm, and in 1683 he made drawings of minute organisms obtained from material collected from the teeth. In 1692 he wrote the first accurate description of several forms of bacteria, vibrios, bacilli, and spirilla.

Nicholas Audry, a noted theoretical physician of the time, was one of the first to consider these organisms, which he classed as worms, as the cause of disease.

It was an Austrian, Marcus Plenciz, in 1762, who first insisted on the specific character of the infective agent in *every* case of disease, and yet, until comparatively recent times, it was believed that all organisms developed spontaneously.

Linnæus was the first to classify bacteria, and he classified them as "chaos." Very little progress was made until 1786, when Müller, of Copenhagen, commenced to study the biology of micro-organisms and based a classification on the result of his studies.

The controversy now arose as to whether micro-organisms were spontaneous in origin or whether they were the offspring of pre-existing organisms. A series of practical experiments, conducted by Spalanzini with the object of solving the question, led to very practical and unexpected results. He proved that if a flask containing fluids rich in bacteria were boiled, and sealed during the process of boiling, not only would the bacteria be destroyed, but so long as the flask remained sealed no bacteria were to be found, and no putrefaction took place. Taking practical advantage of this discovery, a Frenchman named Appert introduced the system of tinned meats, fruits, vegetables, &c.

The controversy in connection with the spontaneity question lasted until 1854, when it was finally settled by Schroder and Von Dusch, but as late as 1872 a work was published by Charltos Bation to prove that spontaneous generation did actually take place. He found that some fluids, after being boiled for ten minutes and hermetically sealed during the boiling, contained bacteria after a time. This gave rise to further research, and it was found that there were minute bodies—the spores—which were tremendously resistant to germicidal agents, but it was found that even these could be destroyed by repeated boilings.

In 1837 the yeast plant was discovered, and during the same and the following years separate investigators found micro-organisms in cholera and silkworm disease, and, soon after, fungus threads and spores were found in favus, herpes, and pityriasis. In 1850 bacteria were found by different observers in the blood of sheep and cattle dead of splenic fever.

In 1857 Louis Pasteur, to whom the whole world owes a debt of gratitude for his researches, announced that the lactic, acetic, and butyric fermentations were produced by micro-organisms. He followed this up by a careful study of the silkworm disease, and had the satisfaction of discovering a remedy.

In 1872 Bollinger discovered the anthrax spore, and in 1877 Robert Koch wrote the full life-history of the anthrax bacillus, and gave definite proofs of its pathogenic properties. By means of the warm stage he studied the whole life cycle from the fission of the rods to the formation of spores and the sprouting of spores into fresh rods. To Koch, moreover, is chiefly due the honour of placing the doctrine of the living contagia on a truly scientific basis. He it was who really settled the question of pathogenesis of bacteria.

It is a comparatively easy matter for any one to examine with a microscope portions of the tissues of diseased animals and to find micro-organisms present. The difficulty is to prove beyond doubt that a particular micro-organism and no other is the cause of one definite disease only. Koch insisted on the following postulates, nothing short of which is satisfactory.

The micro-organism must be found in the blood, lymph, or diseased tissue of man or animal suffering from or dead of the disease.

The micro-organisms must be isolated from the blood, lymph, or tissues, and cultivated in suitable media, *i.e.*, outside the animal body. These pure cultivations must be carried on through successive generations of the organism.

A pure cultivation thus obtained must, when introduced into the body of a healthy animal, produce the disease in question. In the inoculated animal the same micro-organisms must again be found.

Classification of micro-organisms according to form.—Bacteria is the name now given to all micro-organisms irrespective of shape, although the term is derived from a Greek word signifying a little rod. When bacteria are round or oval in shape they are known as cocci or micrococci; when two of these round or oval cells remain joined together it is known as a diplococcus. If several remain linked together like a string of beads we get a streptococcus. When a coccus divides into eight the result is a sarcinacoccus. When the cocci are arranged in irregular masses the groups are known as staphylococci.

Now for the rod-shaped forms. The name given to all straight rods is bacillus. When the rod is slightly bent it is a vibrio, when it is spirally coiled it is a spirillum; then there are the filamentous forms, straight or leptothrix, wavy or spirochaetæ, looped and entwined spirulina.

Structure and Composition.—If we look upon each bacterium as a single cell, we find the structure to be a cell wall, or investing membrane, cell contents or protoplasm, and perhaps a nucleus.

The composition of the different species varies, but I think that each specific organism has its own definite composition; for instance, the active chemical principle of the anthrax or black-quarter bacillus must be more or less definite, although its virulence may be increased or

attenuated, for, when introduced into the animal system, they always produce the same pathological conditions.

Movement.—Some bacteria are non-motile or motionless, others are motile, *i.e.*, they possess the power of propelling themselves. The character of the movement varies from a slow wavy motion to one of extreme rapidity. Motility is dependent on the possession of delicate hair-like flagella or cilia.

Reproduction.—Bacteria are reproduced by fission or by sporulation. By the first of these methods, each organism merely becomes elongated and then divides across. In the case of sporulation, a small speck (or specks) appears in the organism and grows at the expense of the protoplasm of the cell, which in time disappears altogether, and the spore is set free. The spore is often wider but never longer than the parent cell.

Respiration and Nutrition.—Bacteria require for their nutrition oxygen, nitrogen, carbon, water, and certain mineral salts. Many require free access to oxygen, others derive it from the oxydised compounds in which they grow, and accordingly as they require free oxygen or not they are classed by Pasteur as *aërobic* and *anaërobic*. A bacterium which lives in natural circumstances on dead organic matter is known as a *saprophyte*. Those which live in the tissues of living animals causing disease are known as *parasitic* or *pathogenic*.

The bacillus of malignant œdema is to be found in enormous numbers in the intestinal canal of herbivorous animals, and that of tetanus is an almost constant inhabitant of cultivated soil, but when these organisms propagate in the tissues of the body they are the causes of very fatal diseases. Such parasites are known as *facultative*.

Those bacteria which in natural circumstances do not propagate elsewhere than in the living animal body are termed *obligatory*. Examples of such are the bacilli of tuberculosis and glanders.

Cultivation.—Bacteria, if sown on a suitable soil and kept at a suitable temperature, may be grown just as one would a crop of wheat. Many different media are used as suitable soils for the various species, and many kinds of bacteria can be recognised with the naked eye by their very characteristic mode of growth.

Products of Bacteria.—Bacteria, as a result of their metabolic processes, produce many different substances. Some manufacture *pigments*, the colours varying with the species. Others produce *light* (photographs of phosphorescent bacteria from sea water can be obtained from their cultures by their own light).

Fermentation is produced by bacteria. The acetic, lactic, butyric, and viscous fermentations are the result of bacterial activity. Putrefactive bacteria produce changes allied to fermentation in complex organic substances. This class is of peculiar interest to us because some of the products of their activity are those poisonous alkaloids or ptomaines.

The first we hear of a ptomaine was in 1822, when Gaspord and Stick discovered a very poisonous principle in extract of meat. In 1856 Panum found a similar principle in putrid fish; and in 1863 other observers discover a ptomaine in putrid beer; but it was Gautier and Seluir who, not many years ago, established the fact that ptomaines were developed as the result of the decomposition of albuminoid material. Ptomaines are of great medical importance by reason of the frequent cases of poisoning produced by the eating of tinned and other meats, fish, vegetables, &c., which are undergoing decomposition or putrefaction. Another class of organisms

which is of the greatest economic importance is that group known as the *nitrifying* bacteria; they provide plant life with a most necessary food. But the organisms with which we are chiefly concerned are the *pathogenic* or disease-producing organisms; they give rise to virulent poisons or toxins. Many bacteria have with certainty been proved to be the sole cause of certain definite disease. For instance, we could no more have a case of anthrax or of tuberculosis except as the result of the infection by the specific bacilli than we could grow a field of cabbages without first sowing the seed. The microbes of cholera, typhoid, tetanus, diphtheria, glanders, bubonic plague, pneumonia, erysipelas, and septicæmia, among others, have also been isolated and carefully studied within recent years.

A remarkable fact in connection with the invasion of an animal by the bacilli of diphtheria is that they do not become disseminated throughout the system, but remain localised at the point of infection where they propagate, and manufacture a toxin which is rapidly distributed through the body.

Antitoxins.—An antitoxin is a product developed in the body as the result of the implantation of a toxin acting as a neutraliser of that toxin. As examples we may quote the anti-diphtheric serum which has proved to be a great success in the treatment of diphtheria. Tetanin, which is an effectual preventive of tetanus, although unfortunately the hopes aroused with regard to its curative properties have not been realised, at least as far as the lower animals are concerned. Then there is an anti-streptococcic serum which has been proved to be very useful in septic cases, notably those of puerperal fever and erysipelas. Other well-known bacterial products which are not cultivated in the live animal are mallein and tuberculin.

Immunity.—By this term we signify that condition of being insusceptible to an infective disease—proof against infection from any particular germ. The condition may be natural; for instance the ox is immune to glanders, the horse to contagious pleuro-pneumonia, cats, white mice, and Algerian sheep to anthrax. Or it may be acquired—for instance, one attack of measles or smallpox as a rule affords lifelong protection.

In many diseases an artificial immunity can be produced by experimentally infecting an animal with an attenuated virus, thus giving the animal it is desired to protect a mild attack of the disease.

There are a great many theories extant to account for the mechanism of immunity, but they are so widely divergent that it is difficult to say which, if either, is right. The whole question of immunity, antitoxins, toxins, serums, ptomaines, and the chemical products of bacteria generally is only as yet in its infancy. Now, if we realise that all these discoveries have been made within the last few years, and that the whole science of bacteriology was only a short time ago a closed book, we can appreciate the vastness of the strides already made, and look forward with greater hopes into the future. The whole field of bacteriology to my mind may be compared to a great unexplored land; you effect a landing, and get to the top of the first range of hills, and on peering into the distance you see farther hills stretching away as far as the eye can reach; and by-and-bye if you reach the top of the most distant one, you see still more and more hills, some perhaps so far distant that only just the faintest outline can be made out. And so it is with science; every little obstacle you surmount enables you to see farther and farther into the possibilities of the future.

I believe we may reasonably look forward to a great future for the serum treatment of diseases; there appears to be something so rational in the very idea of serum-therapy. It is to bacteriology we have to look for any great discovery in connection with diseases.

I propose now to deal with a few of the specific bacteria, passing a few remarks on each, touching upon the points of greatest importance, and at the same time showing you photographs of the actual bacteria on the sheet.

I may say that I am indebted to Professor M'Fadyean for the loan of lantern slides.

Anthrax.—There is as a rule very little difficulty in demonstrating the presence of the anthrax bacillus if a small drop of blood be taken from the animal soon after death. If the animal is only just dead, the blood may be taken from any part, but if some hours have elapsed it is better to take it from one of the small veins of the ear or the foot. The reason for this is, that in some cases putrefaction takes place very rapidly, and putrefactive bacteria multiply enormously in the great abdominal organs and spread by way of the blood-stream, and as a matter of course the small veins of the extremities are the last to be invaded. Some of these putrefactive bacteria closely resemble those of anthrax, therefore it is wise to pay attention to this detail. A small droplet of blood should be placed on a cover-glass, and examined with a 1-16th inch objective. The bacilli will generally be found present in large numbers; they vary in size from 5 to 20 micro-millimetres long by from 1 to 1·25 broad (a micro-millimetre or a micron is the 1,000,000th part of a metre, and in order to the more readily compare the dimensions of the bacilli I may remind you that the diameter of a red blood corpuscle is from six to seven microns). The anthrax bacilli are non-motile, they are generally straight, but sometimes slightly curved, and always rigid. The rods are very easily stained by a watery solution of any of the aniline dyes, and are then seen to be composed of segments with their extremities truncated at right angles; between the segments a clear linear space exists which gives them a characteristic appearance.

The bacillus of malignant œdema, or the septic vibrio, as it is sometimes called, varies in length from 3 to 5 microns, and in breadth from 1 to 1·1 microns; they mostly lie in pairs, and then appear to be double this length; they even have a tendency to form threads. This organism is interesting to us chiefly because under the microscope it may be mistaken for the anthrax bacillus, but it may be distinguished by being thinner, having rounded ends, and being motile, and the segments of which the rods are composed being longer than in the case of anthrax. These differences look a deal greater on paper than they do under the microscope, and it is necessary to exercise great care to avoid making an error. This bacillus is a constant inhabitant of the alimentary canal of the herbivora, and after death it invades the blood and tissues, penetrating outwards from the intestines. This is especially the case when the blood is in a deoxydised condition such as that found in an animal dead of anthrax.

Black-Quarter.—The bacillus is found in the emphysematous swelling which is characteristic of the disease, the emphysema being produced by a gas liberated by the bacilli in the tissues. It varies in length from 3 to 5 microns, and in breadth from ·5 to ·6 microns, the ends are rounded, and the bacilli are motile. Sporulation is present; the spores are oval and

often wider than the bacilli ; they are generally situated near to the ends of the rods. The bacillus is distinguished from that of anthrax by being smaller, by not being found in the blood, and by being motile, it being furnished with numerous flagellæ.

Filtered cultures of this bacillus have been used for the purpose of producing immunity, and have to some extent been successful, but the results up to now cannot be said to be of any practical value.

Tuberculosis.—This is perhaps one of the most, if not *the* most, important of the bacterial diseases with which we are concerned. The bacillus was discovered by Koch in 1882. They occur as rods 2 to 4 and occasionally 8 microns in length. They are straight or curved, and very frequently beaded, very thin, and rounded at the ends, and occur singly, in pairs, and in bundles. They are non-motile. The organism is a tissue parasite, the intestines and lymphatic spaces of the tissues are the most favourable grounds for its growth. It probably never propagates by the blood, but it is occasionally carried by the blood-stream. When they get into the blood-stream they do not for any considerable length of time continue to make the round of the circulation, but are arrested, and set up fresh centres. The tubercle bacillus is strictly obligatory. It never propagates outside the animal body except when man intervenes. The main reason for this strict parasitism is that the bacillus does not find outside the body the temperature necessary for its growth. The tubercle bacillus is much more resistant to germicides than most micro-organisms ; and now perhaps a word or two as to the method of preparation of tuberculin.

Tuberculin is the sterilised and filtered product of the tubercle bacillus. It is prepared by cultivating the bacilli in 5 per cent. glycerine bouillon. The culture is made at body temperature, and is carried on for three weeks or longer. The flasks at the end of this time are sterilised by steaming once at 120° C., or by intermittent steaming on three successive days at 100°C. After that the turbid liquid is freed from the dead bacilli by filtration through porcelain ; a half per cent. of carbolic is added to give it keeping properties.

Glanders is a disease which was described more than 400 years ago. It is of the utmost importance to us, because of the great loss it occasions to horse-owners, and of the very ready manner in which it is spread to man. The cause of the disease is the *Bacillus mallei* discovered by Löeffler and Schütz in 1882. They are rods with rounded ends, shorter and thicker than the tubercle bacillus, occurring singly or in pairs, sometimes in filaments. It is a tissue parasite, being found in extra-vascular positions in the lesions, also in pus and in discharges from the nostrils. It generally spreads by way of the lymphatics, but it is sometimes disseminated by the blood-stream.

Mallein, which is a porcelain-filtered and sterilised glycerine extract of the *Bacillus mallei*, is prepared in a similar way to tuberculin. It is used as a diagnostic agent, and we have great reason to hope that it will shortly be proved to be curative also.

Tetanus.—The bacilli of tetanus are straight slender rods, nearly as large as those of anthrax, with often a terminal spore which gives them a drumstick appearance. The bacillus is remarkable in that it is one of the facultative parasites, *i.e.*, it is only occasionally that it takes on pathogenic properties. It has a very wide distribution ; originally it was cultivated from ordinary garden soil, but successful inoculations have since been

made with such material as the sweepings of a hayloft and the dust which had accumulated on harness, the grime off a man's hand, dirty surgical instruments. As a rule it is the soil rich in organic matter which is usually richer in the bacilli of tetanus. Another remarkable feature of this organism is, that when it takes on pathogenic properties it is only found at the seat of inoculation and its immediate vicinity. It there manufactures a poison which circulates in the system, and gives rise to tetanic symptoms. The tetanus bacilli form their poison slowly, and in healthy tissues they are rapidly destroyed by the tissue cells long before they have time to form sufficient poison to produce the nervous symptoms of tetanus.

Tetanin is an antitoxin extremely useful as a preventive of tetanus in horses, and in man is said to be curative when injected under the *dura mater*. Antitoxin for use in the serum treatment of tetanus is obtained from the horse. The tetanus bacillus is cultivated in an atmosphere of hydrogen in flasks specially constructed for the purpose. In about a fortnight the cultures are extremely toxic. The toxin is obtained by filtration through porcelain. Injections may be given daily subcutaneously or intravenously, beginning with 1 c.c. of iodised toxin and gradually increasing the dose until the pure toxin may be injected without danger. When a few days have elapsed after the last injection the blood is drawn by means of a trocar and canula from the jugular vein into a sterilised glass vessel and set aside to coagulate. Next day the serum is drawn off with a pipette and used in the liquid state or dried in a vacuum over sulphuric acid, and subsequently powdered. When required for use the powder is dissolved in cold water.

Diphtheria is specially interesting to the medical world because it is the first disease in which the specific organism known as Löeffler's bacillus has been isolated, in which the antitoxin treatment was found to be successful. The bacillus is easily obtainable from the throat of any one suffering from diphtheria; they are straight or slightly curved rods 1·5-6·5 microns in length by ·3-·8 microns in breadth. They occur singly, in pairs, sometimes in chains, and sometimes as short leptothrix forms. The bacillus is non-motile, and spore formation is unknown. According to Klein the disease is communicable by cats. The employment of the diphtheria antitoxin as a therapeutic agent is based on the discovery that the blood serum of immune animals is antagonistic to the development of the toxin, and consequently the blood of an immune animal is capable of neutralising the toxic properties either in a living animal or when added to a culture in a test tube.

Typhoid Fever.—The micro-organism is a bacillus 1-3 microns long by ·5-·8 microns broad, and threads. They are very motile, and provided with flagellæ, which are from three to five times as long as the bacilli; but whether this bacillus is really peculiar to typhoid is, I believe, still a matter of dispute. In the present state of our knowledge no one is justified in saying that the typhoid fever bacillus is the only cause of typhoid fever (inoculations with an antitoxin from it have certainly proved to be a failure), but it is generally accepted that the disease is conveyed by water and food which have been contaminated with the virus contained in typhoid evacuations.

Asiatic Cholera.—The usual organism is the *Spirillum choleræ Asiaticæ* or comma bacillus, discovered by Koch. It occurs in the form of curved rods, spirilla, and threads. They are actively motile, and possess flagellæ.

Strangles is another disease caused by a specific organism, a streptococcus closely resembling a necklace.

Bubonic Plague.—Although this is a disease with which we are not directly concerned, it is well to remember that rats are very susceptible to the disease, and provide a very ready means of spread by shipboard. The organism is a short rod with rounded ends, and is found in the lymphatic glands.

Pneumonia.—The specific micro-organism is known as the pneumococcus; it is, as its name implies, a coccus, but also occurs as a diplococcus, streptococcus, and bacillus. It is found in the pneumonic exudate and sputum.

Lastly, I will mention a group of organisms known as the pyogenic or pus-producing organisms: they are *Staphylococcus pyogenes aureus, albus, citreus*, and the *Streptococcus pyogenes*. These organisms are credited with giving rise to the formation of pus.

Now I have arrived at the limit of my time. There are many more organisms which I might have dealt with had time permitted, but I think you will agree with me that I have said enough to prove the relation between, and the supreme importance of, the science of bacteriology to the veterinary profession. There is a tremendous field waiting to be explored in the science. For instance, take small-pox and rabies; here we have two well-known and dreaded diseases, the symptoms of which are produced by a virus, but of which the micro-organism is still undiscovered. Then there are rinderpest, swine fever, pleuro-pneumonia, foot-and-mouth disease, cow-pox, sheep-pox, foot-rot, and many other diseases which are in all probability produced by microbes.

In conclusion, bacteriology has already furnished us with the means of prevention, diagnosis, and cure of many diseases, and considering that it is only now in its infancy, we may look forward with hopes that in the future we shall by its aid be enabled to proceed on more rational lines to the extermination of many more.

EXPERIMENTS UPON THE NEW SPECIFIC TEST FOR BLOOD.

(Preliminary Note.)

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(From the Pathological Laboratory of the University of Cambridge.)

The recent discovery of specific precipitins which act upon various bacterial products—milks, peptone, egg albumen, and different kinds of blood—has led us to undertake the investigations which are here presented in abstract. A complete review of the literature of the subject, as also a detailed report upon our experiments, will appear in the forthcoming number of the *Journal of Hygiene.*

We have injected rabbits intraperitoneally with horse, dog, ox, sheep, and human serum, and have been able to observe the formation of specific precipitins in their blood. The antiserums from these animals have been tried on twenty-four different bloods with uniformly negative results, when

we except the slight action exerted by the antiserum for human blood upon the blood of two species of monkey. In this case a slight reaction was obtained which could not be compared in intensity with that shown on the addition of the antiserum to human blood. A slight clouding was produced by the antiserum for ox blood when added to sheep's serum, and *vice versâ*. Some animals already gave an effective serum after the third injection.

Bloods which had been tried for two months and preserved at room temperature, either in the dark or exposed to diffuse daylight, or in the dark at 37° C., as also such as had been exposed for a week to the action of sunlight, as also serum from a blister the result of a burn, all gave a positive reaction when tested with their particular antiserum. Some human blood which had undergone putrefaction for two months, when diluted 1 in 100 with normal salt solution, gave a marked reaction with the antiserum for human blood, which it did not do on the addition of other blood serums. A rabbit which was treated with some old antidiphtherial horse serum preserved with tricresol in a corked bottle for two years and seven months, yielded a specific precipitin for horse serum. Positive results were also obtained by treating a rabbit with a pleuritic fluid which had been kept in the laboratory for five to six months, and preserved by the addition of chloroform. A slight but distinct reaction was obtained with human nasal and lachrymal secretion.

Dilutions of human blood (1 in 100) mixed with an equal volume of dilutions of the blood of the ox, sheep, dog, and horse, and tested for human blood, all gave a positive reaction, and *vice versâ*. Control experiments with normal rabbit serum, as also with non-homologous antiserums, gave negative results.

The investigations we have made confirm and extend the observations of others with regard to the formation of specific precipitins in the blood serum of animals treated with various serums. We conclude that these precipitins are specific, although they may produce a slight reaction with the serums of allied animals. The substance in the serum which brings about the formation of a precipitin, as also the precipitin itself, are remarkably resistant. The new test can be applied to a blood which has been mixed with that of another animal.

We have in this test the most delicate means hitherto discovered of detecting and differentiating bloods, and consequently we must hope that it will be put to forensic use.[1]

ANTHRAX CAUSED BY INFECTED FOOD: AN INTERESTING CASE.

In this case Lord Brougham claimed damages from the defendants for breach of warranty in supplying him with linseed cake for his cattle which was alleged to be infected with anthrax bacilli, in consequence of which several animals died.

Mr. Jelf, K.C., and Mr. Montague Shearman appeared for the plaintiff; and Mr. Pickford, K.C., and Mr. Willes Chitty were for the defendants.

Lord Brougham is a breeder of pedigree Shorthorn cattle, and the de-

[1] *British Medical Journal*, March 30th, 1901, p. 788.

fendants, Messrs. Pattinsons and Winter, merchants, of Penrith, were in the habit of supplying him with cattle food—linseed cake and square feed cake. Lord Brougham kept his cattle at three farms on his Cumberland estate—Eamont Bridge Farm, Gardens Farm, and Hospital Farm. On March 9 last year two bulls died at the Eamont Bridge Farm. On March 25 a cow died at Gardens Farm. On March 27, 29, and 30 two more bulls and a cow died at Eamont Bridge Farm. The cattle all died of anthrax; and the cake supplied by the defendants was suspected as having been the means of conveying the disease. The cattle that died were valued at £225; and the plaintiff sought to recover that amount from the defendants for having supplied infected cake.

Mr. BOLUS, a veterinary surgeon, who made an examination of the dead cattle, deposed that they died from anthrax, the period of incubation of which disease was from two to seven days. The worst of the outbreak occurred at the Eamont Bridge Farm, where there had been a previous case of anthrax in 1891. One of the bulls which died first was skinned and dressed, it not being known at the time that the animal had died of anthrax. The bailiff, immediately he knew what the cause of death was, made the men who had touched the body thoroughly disinfect themselves. Mr. BELL, another veterinary surgeon who was called in, made all inquiries as to the food of the cattle, and made an examination of the buildings where they had been kept, which he found in excellent order. He advised that no more of the linseed cake should be supplied. Anthrax was a disease which was conveyed by food or water. Mr. Bell, being the county veterinary inspector, had had great experience of outbreaks of anthrax, and he said that in his opinion the disease could only be introduced into the system by food or drink. It was possible that the germs might be breathed in, but that was contrary to his opinion and experience. He thought that if the linseed cake was stopped the outbreak would cease. There had been an outbreak of anthrax in the neighbourhood a few years before, and Mr. Bell believed then that the disease was caused by the cake on which the cattle had been fed.

Professor M'FADYEAN, Principal of the Royal Veterinary College and Professor of Bacteriology, said he went up to Brougham and inspected Lord Brougham's herd of cattle on March 30. He suspected the linseed cake as having been the cause of the outbreak of anthrax, and some pieces of the cake were supplied to him on April 5. He tested the cake by pulverising it and mixing it with water. He then strained it through muslin and injected the liquid into two guinea-pigs and a sheep. Several days afterwards one of the guinea-pigs was moribund and was killed. Witness made a microscopic examination of the animal, and found all the characteristics of anthrax. He also found the liquid which had been injected swarming with anthrax bacilli. The other guinea-pig and the sheep showed no symptoms of anthrax. The conclusion witness drew was that the cake which had been supplied was infected with the bacilli of anthrax. The witness produced a glass tube which he said contained a number of anthrax bacilli.

Mr. JELF.—I hope it is well corked up.

WITNESS.—Yes; it is perfectly safe. (Laughter.) Continuing his evidence, Professor M'Fadyean said that the germs were usually introduced into the blood through food or water. He had no doubt that the cake was infected with anthrax. It was possible that the cake might have been infected by

the carelessness of persons who had touched the animals which had died; but, hearing the precautions which had been taken in this case, he was of opinion that the cake had not been so infected. Anthrax was not an infectious disease in the ordinary sense.

Cross-examined.—Witness considered that the bacilli were adhering to the linseed before the cake was manufactured. If the linseed had been subjected to a boiling temperature the bacilli would have been destroyed. He could not, therefore, believe that the linseed had been subjected to a temperature of 280 degrees. This was the first time he had ever found anthrax bacilli in linseed cake. It was a dangerous thing to open and skin the carcase of a beast which had died of anthrax; and the operator, if he afterwards handled food materials, might convey to them the bacillus, but it would be highly improbable. If one drop of blood had been conveyed to the food it would bring with it a great number of bacilli.

Professor DELEPINE, a bacteriologist, also gave evidence of a similar character.

For the defence, Mr. WINTER, a partner in the defendant firm, was called. His firm had supplied large quantities of the same cake as was supplied to Lord Brougham to many farmers in the neighbourhood of Penrith, and no complaints had ever been made with regard to it.

Cross-examined.—The defendants did not manufacture the cake themselves, but obtained it from Messrs. Earle & King, with whom they had dealt for many years. Witness knew nothing about the ingredients of the cake. A previous outbreak in 1898 at a farm in the neighbourhood was attributed to some cotton cake supplied by the defendants. They then substituted linseed cake for the cotton cake, but witness was unaware that there had been another outbreak of anthrax at that farm at the beginning of this year.

Mr. HAROLD KING, manager of Messrs. Earle & King (Limited), manufacturers of linseed cake, &c., said they turned out about 500 tons of cake a week, and it was distributed all over the country. Before the case there had never been a suggestion of anthrax bacilli being present in their cake. At the time in question they had obtained their linseed from India. The linseed was purified after it came into their possession, and went through various processes under a very high temperature before it was turned into cake. After hearing complaints about the cake in question, witness went to Penrith and endeavoured to get samples, but could not. Professor Boyce then came to their manufactory and took samples of the linseed from which the cake had been made. Subsequently Professor Boyce obtained samples from Lord Brougham's bailiff of the cake complained of.

Cross-examined.—The defendants sometimes got linseed from America and the River Plate, occasionally from Turkey, and once from Russia. Witness could not say what the actual temperature of the linseed meal would be when going through the steaming process, but it was probably about 160 to 170 degrees Fahr.

Professor BOYCE, Professor of Bacteriology at Liverpool, and Public Analyst for Liverpool, who had had much experience in connection with anthrax, said that samples of grain had frequently been sent to him for examination. He had never known of the anthrax bacilli being found in oil cakes. He went to Messrs. Earle & King's factory and took samples of linseed there. There was nothing to indicate the possibility of the

bacillus getting into the linseed at the factory. He examined many different samples and found no trace of anthrax in them. Subsequently he went with Mr. King to Lord Brougham's farms, and he obtained samples of cake from each. Those samples showed no trace of anthrax bacilli after very searching tests. It is quite possible that a bull which died of anthrax in 1891 might have accounted for the outbreak of last year.

Cross-examined.—Witness' tests of the meal showed numerous bacteria, but no anthrax bacilli. About 99 per cent. of the bacteria had been killed by the steaming process. Witness inoculated twelve guinea-pigs, and they all thrived.—(Laughter.) Witness was not aware that India and the River Plate were places where anthrax was most prevalent. He did not agree that anthrax was conveyed chiefly by food or water. It was quite possible that food might infect the animal, but food was not the most probable source of the disease. In this case he thought that the outbreak was more probably due to previous anthrax in the place. The anthrax bacillus found by Professor M'Fadyean must have been conveyed to the cake after it got to the farm.

Professor SIMS WOODHEAD, Professor of Pathology at Cambridge, said that he received samples of the cake for examination, and he found no traces of anthrax bacilli. He thought it possible that outbreak of anthrax might have arisen from the outbreak in 1891.

Dr. KLEIN, F.R.S., an eminent bacteriologost, and Professor MUIR, of Glasgow University, also examined samples of the oil cake, and found no traces of anthrax bacteria.

Professor PENBERTHY, of the Royal College of Veterinary Surgeons, said that the spores of anthrax bacilli would live, under favourable conditions, for more than nine years. He thought the outbreak probably due to the men on the farm who had touched the dead cattle handling the oil-cake.

Evidence was also given that the same linseed cake had been supplied to Lord Lonsdale and other gentlemen in the neighbourhood of Penrith, with no ill effects to their cattle.

Counsel having addressed the jury,

Mr. JUSTICE MATHEW summed up, and told the jury that the question for them was whether the death of the cattle in question was due to the cause attributed by the plaintiff.

In the result the jury found a verdict for the plaintiff. The damages were agreed at £304 : 13 : 6 ; and judgment was given for the plaintiff accordingly for that amount.—(*The Times*, May 18 and 21, 1901.)

FUND FOR DEFRAYING QUARANTINE EXPENSES OF DOGS OF SOLDIERS RETURNING FROM SOUTH AFRICA.

LORD KITCHENER has made known to the Army in South Africa the above fund, and a number of veterinary surgeons who have kennels have intimated their intention of keeping a soldier's dog free of cost during the period of quarantine.

Any member of the profession desirous of assisting is requested to intimate so to the Chairman, FRED. E. PIRKIS, Esq., National Canine Defence League, 151 Strand.

A PROFESSIONAL OUTLOOK.[1]

BY G. R. DUDGEON, M.R.C.V.S.

GENTLEMEN—When Mr. Nisbet declined to occupy the chair, and Mr. Peele refused on account of his youth and inexperience, you, gentlemen, elected me. Either of the two gentlemen would have fulfilled the office with greater dignity, but I will yield to neither in my desire to promote the interests of our Association.

The Association owes a great debt of gratitude to Mr. Nisbet, and, to my mind, it has not repaid it. At the time when the profession was in arms against what was known as the 9th Clause, he, at great inconvenience and expense, allowed himself to be nominated for the Council of the Royal College of Veterinary Surgeons by this Association, and was elected by the profession. How faithfully he discharged his duties we well know, and had he allowed himself to be put forward when his time expired I am sure he would have been re-elected.

Gentlemen, it is exactly thirty-seven years ago and one month since the first presidential address was delivered at this Association. The Association since then has had its ups and downs. It was down some years ago; in fact, it was nearly dead. It awoke with renewed energy after its rest and did real good. I am afraid at the present time, although not dead, it is moribund, which, to my mind, is almost a worse state. At present the Association seems to be in a state of deathlike, careless inactivity, a partial paralysis which requires a very strong stimulus indeed to arouse it. What is the cause of this? I confess I do not know. Let us look the facts fairly and squarely in the face. Here is an Association which has been in existence for more than thirty-seven years; an Association that in its time has been a power, a strong power. Unfortunately, I have not had the time to look up all the resolutions, &c., which have been recommended by this association, and which have been adopted by the Council of the Royal College of Veterinary Surgeons. A goodly lot. I ask, Is it right? Is it just? Is it wise to let such an Association as ours lose its power and influence? I say no, a thousand times no. You, gentlemen, can prevent it. You who are not members can get elected to the Association by a very easy process. You who are members can, by your influence—you all have some friends in the profession—induce them to join us. Sink petty differences, jealousies, and all uncharitableness. Remember our motto—*Vis unita fortior*—and unity will be strength.

My one desire is to bring together the members of our profession in the North of England. See that all members are made equal and at home. Every member is entitled to his opinion, and every member should express it. Differences of opinion will, must, and should arise if the Association is to prosper. The more discussion the better. The more subjects are ventilated the more likely we are to get at the truth. Only keep out the personal element, forget your personal differences, and remember you are met together for the good of the profession, and nothing will prevent the Association prospering. I have dwelt strongly on this part because I feel strongly. It is astonishing when we meet together and have a friendly conversation how soon little and big differences are put to one

[1] Presidential Address delivered at the Annual Meeting of the North of England Veterinary Medical Association on February 15, 1901.

side. Things which seemed big after a little chat assume small proportions. I say, come and let us consult together.

It is usual for the president, when delivering his address, to review the politics of the profession. At present no burning questions are before us. This may be either good or bad for the profession. It may be we are fully satisfied that the powers that be are doing right; or it may be the profession is lax. A truly progressive body should not be content to stand still. It is not a good sign when everybody apparently is satisfied. To stand still is to retrograde. Apathy is the forerunner of carelessness. When we begin to get careless, it requires something strong to arouse us. There has been a little stir on the old education question lately. I think we will all agree that the better educated a man is the more likely he will succeed in the profession or trade which he adopts. The profession fixed a certain standard of education a few years ago. And that was the same as the medical. The medical have since raised their standard. The question is, Are we to follow the medical profession and demand from our students a preliminary examination equal to theirs? Or is the standard we have at present sufficient? I am of opinion—although a strong advocate for education—that at present our matriculation examination is sufficiently high to meet all the requirements demanded of a veterinary surgeon. A difference has arisen on this question. The Scottish schools say the educational examination demanded by their examining board is higher than that of the English examining boards. Without going into the *pros* and *cons* of the matter, I think there should on no account be any difference in the examinations. They should be equal. And if our Council exercise a little reasonable common sense I see no reason why a fair and equitable arrangement should not be arrived at. Mind, I am thoroughly in favour of high education for our students. The better they are educated, with more ease will they grasp all the difficult matters pertaining to the profession. At present the remuneration the veterinary surgeon obtains from his clients is not a sufficient recompense for the time and money which has been expended on his education. The higher the education demanded the better should be the fees which our graduates can obtain when in practice. The time is not yet for a university degree, but it will come. The general public, and especially public bodies, will have to pay the veterinary surgeons better for the valuable services which have and are being rendered to them by us before we can ask from our students a preliminary examination equal to that of medicine, law, or divinity.

Gentlemen, if I may tread for a moment or so on dangerous ground, I would ask: Is it altogether our clients' or public bodies' faults that we are so badly paid? Do we not sometimes underrate our services? If a member of the profession takes work at a low figure for the sake of getting that work, I would ask: Is he not undervaluing his services? And is he not, by taking small pay for valuable services—for valuable services he must render if he does his duty—belittling the profession to which he belongs? A little trades-unionism in our profession would do a lot of good; but this is forbidden ground, therefore I will say no more.

No inaugural address would be complete without reference to tuberculosis. As you know, volumes have been written about it, and probably volumes will still be written. The medical profession at present have a lot to say about it, and have a lot of suggestions to make; I cannot enter into the controversy. You all know as much about it as I do. This

I will say, and maintain, given the powers, the veterinary profession are fully ready and prepared now to stamp this insidious disease out of our herds. Yes, and they will do it long before the medical profession has made much diminution in the number of cases amongst their patients. We are ready and willing to be put to the test.

A word or so about the inspection of meat. Who is so qualified to properly discharge this most important duty—with regard for the health of the public—as the Veterinary Surgeon! Who by all public bodies is so discarded? Need I say the Veterinary Surgeon. The Medical Officer of Health—probably he may never hardly have seen the carcase of a beast before his appointment to this most important office however—assisted by his staff of plumbers, broken-down butchers, and members of nearly all other trades, is now prepared to give an expert opinion, and what is more surprising, the Magistrate, if the case is before the Bench, will in most cases accept their evidence before that of a veterinary surgeon. Here the medical and veterinary professions should run hand in hand for the good of the public. I am astonished that the powers that be do not see this plain fact, and insist that all carcases of meat should be examined by a Veterinary Surgeon and Medical Officer of Health before being condemned. I believe that even butchers would be satisfied with this arrangement. The Veterinary profession, I am sure, would gladly co-operate with the Medical in this matter. The wise Medical Officer, will, I know, be glad of the assistance of the Veterinary. This may come in time.

Before concluding it is my duty to allude to the sad loss the Empire has recently sustained in the loss of our well-beloved Queen Victoria. No words that I can use could sufficiently extol her goodness. We mourn her loss. I am sure that none of her subjects more regret her decease than do the Members of the North of England Veterinary Medical Association. King Edward VII. reigns. We sympathise with him and the other members of the Royal Family in their great affliction. We respectfully bow in allegiance to our Sovereign The King, and pray long may he reign. The Victorian era is past. The greatest, noblest, and best in the history of our Nation has gone by. Gentlemen, I am not a prophet, nevertheless the good which has been accomplished in the Nineteenth Century is but an augury of what is to come, provided the Nation is true itself. The example of our late Queen will be ever before our Sovereigns, making them strive to do even better than she did. They will do their duty. With us, the people, rests the greatest responsibility. Nations are built of individuals, so should each individual do his best for the good of his country. Particularly should he do his best for the advancement of the class to which he belongs. The veterinary profession in the north is not doing its best—in fact it seems to me it is trying how little it can do. This is not right, I appeal to the members of the profession in the north of England to come and joins us. Let us consult together; sink our differences; band together for our mutual good and all will be well.

Gentlemen, I thank you for the honour you have conferred upon me in electing me for the second time for your president. I prize it. I will do my very best to promote the good of the Association and the Profession at large. Without your co-operation I am useless. It remains with you and you alone to bring about my desire. We are beginning a new century; the Veterinary profession was not in existence at the commencement of the last. It must go on ever progressing, nothing daunted, seeking the truth.

INOCULATION AGAINST DISTEMPER.

At a recent meeting of the Académie des Sciences, M. Chauveau intimated that experiments had been made in his Institute with this object. He had, he said, by means of intravenous injection of microbes taken from the blood and organs of a guinea-pig which had died of acute septicæmia, produced a disease in dogs which was very like distemper. Believing that he had obtained, if not the specific, at least a nearly related microbe, he had inoculated a lot of dogs against this microbe; further, he had found in dogs suffering from distemper the same microbe, with all its morphological and biological qualities. He succeeded in producing immunity in the dog by subcutaneous injection of cultures. His patients resisted the natural as well as the experimental infection.

THE LATE COLONEL GEORGE FLEMING AND THE VETERINARY PROFESSION.

(*Continued from page* 294).

In October 1875 we see the inauguration of the Exhibition of Cabs and Cabhorses in London, and its first meeting took place at the Alexandra Palace, and among the judges was Mr. George Fleming. In 1875 Dr. Fleming gave to the public his *Manual of Veterinary Sanitary Science and Police*, in two volumes, and the *Times* gave a full column of a review on it, and the work is too well known to our readers for us to comment upon it, other than that it is the classic on the subject even to-day.

In 1875 Mr. Fleming brought out his improved frost stud, and it seemed to meet with general approval.

About this time he entered into lengthy correspondence in the *Times* and other papers on the main topic of the day, namely, the Contagious and Infectious Diseases of the lower animals—principally *Rabies*, *Foot-and-Mouth*, *and Rinderpest.*

In 1877 this indefatigable worker produced his work on *Veterinary Obstetrics*, and of it the *Live Stock Journal* of December 14, 1877, says:—

"At last we have in the English language something that really deserves to be called a text-book regarding a branch of veterinary practice the importance of which is second to none, but which has hitherto had to depend upon practical experience, without the systematic teaching which could make it valuable, or scattered notes and reports in the veterinary journals. The want of such a work was indeed great, and it has been well supplied in the volume before us, which ought to be in the hands of every intelligent stock breeder, as well as of every veterinarian who aspires—much less professes—to understand his profession. It embodies all the English notes and cases available for many years, and also the cream of the observations of Professor Saint Cyr, the celebrated French veterinarian, many of whose own admirable illustrations enrich its pages; and the first question which arises after a perusal is, naturally, how it came about that such a gap has been so long suffered to remain in English veterinary literature. To some extent the author answers that question.

"Obstetricy is not like the other branches of veterinary surgery, in forming a portion of every veterinarian's practice. On the contrary, it is rarely practised in towns or cities, but is almost exclusively limited to animal-rearing localities; there alone is to be found the school in which the practitioner may be initiated into all the difficulties of this complex art, and the best and readiest means of surmounting them. And it must be confessed that the practice of this art is not particularly alluring, and is attended with many more inconveniences, hardships, and difficulties than fall to the lot of the human obstetrist; indeed, we know of no more arduous and anxious occupation than that of the country practitioner in a cattle-breeding district, and he requires physical endowments which are certainly not needed by the attendant on woman.

"Mr. Fleming then draws a vivid picture of the difficulties and repulsive circumstances under which the veterinarian has to perform his task. He has to do with animals so powerful that at the best his fatigues are excessive; must operate often in painful and constrained positions, with clumsy and ignorant assistants; and all this too often in damp, dirty, and ill-ventilated stables or out-houses, cold, and almost in darkness. Add to all this that there is very serious danger of contracting very troublesome, and even dangerous, cutaneous diseases, and we trust that we have said enough to show how much the skilled operator demands thoughtful consideration from his employer. Yet too often is he only sent for when too late, or when time is so precious that precautions which would have added golden chances of recovery to a valued animal, as well as to his own comfort, can no longer be taken, lest a few minutes' further delay should mean death. These things touch self-interest as well as mere courtesy to the men—in these days not seldom *gentlemen*—who voluntarily undertake a task at once the most important and most repulsive of all."

In 1878 Mr. Fleming took an active part in suppressing the cruelty practised on the Thames swans by the operation of "upping."

In the same year the Fleming Testimonial Fund was inaugurated.

"At a meeting held at the Royal College of Veterinary Surgeons on Monday evening, February 18th, 1878—the president, Sir Frederick Fitzwygram, Bart., in the chair—it was unanimously resolved that 'Some recognition is markedly due from the profession to Mr. George Fleming for his eminent services in veterinary literature, and his unselfish and untiring zeal in promoting all objects calculated to advance the welfare of the profession'; and the following members were elected on the committee, with power to add to their number:—Chairman, Sir F. Fitzwygram, Bart.; Professors J. W. Axe, Duguid, Mayer, M'Call, Pritchard, Walley, Williams; H. J. Cartwright, Esq.; W. H. Coates, Esq.; J. Collins, Esq.; J. Roalfe Cox, Esq.; T. Greaves, Esq.; M. J. Harpley, Esq.; J. W. Hill, Esq.; W. Robertson, Esq.; C. Steel, Esq.; D. Hutcheon, Esq., Liverpool Association; T. D. Broad, Yorkshire Association; T. Hopkins, Manchester Association; W. Broughton, Yorkshire Association; W. Carless, Midland Association; H. Olver, Midland Association; H. T. Batt, London; T. D. Barford, Southampton; J. Fraser, Berkshire; J. B. Martin, Rochester; J. Simcocks, Drogheda; J. Waters, Cambridge; G. H. Pyatt, Nottingham; A. Santy, Norwich; C. Stephenson, Newcastle; W. Naylor, Wakefield; J. Gerrard, Lincolnshire; R. Ward, Esq. (treasurer); and on the 5th May

1878, at the annual dinner of the R.C.V.S., the presentation was made, and of it the *Medical Press* on June 1st says :—

"No one in this country has, single-handed, done so much to advance the science of veterinary medicine, or to compel respect for the profession to which he belongs, as Mr. George Fleming. We therefore take great pleasure in congratulating him on the handsome and substantial testimonial which he has just received from his professional brethren. At the late annual dinner of the Royal College of Veterinary Surgeons he was presented with a handsome timepiece, which was engraved with a suitable inscription, and accompanied by a purse containing three hundred sovereigns. Had the testimonial been ten times more valuable it would not have been more than Mr. Fleming deserved. When, a quarter of a century ago, this surgeon first began to devote all his time and energies to the study and advancement of veterinary medicine, he found that science, likewise the profession generally, in a very different state to what it is at present. In those days men studied and practised the veterinary art in a most perfunctory manner. The treatment of the diseases of animals was in the hands of ignorant and uneducated practitioners, many of whom had not so much as dissected a dog. Literature there was none ; so that 'with the largest empire in the world, and an almost incomprehensible wealth in animals, in the way of veterinary science and literature we were far behind the smallest Continental State. To remedy this Mr. Fleming has sacrificed days and nights of labour, which other men give to pleasure or to sleep. To teach himself to speak, write, or read six or seven languages, to make laborious translations, to write on various subjects books which have long become classical and standard works—this was but a part of the Herculean task which Mr. Fleming set himself to accomplish. Truly, there are greater reputations that have been earned on much easier terms. As Mr. Greaves justly remarked, he has proved himself a man gifted with talents of no mean order, and what is more, he has laid out those talents well. Wherever a life-long devotion to a work that has but few rewards is duly honoured, wherever science is cultivated, and the lower animals properly cared for, there Mr. Fleming will be considered to have deserved by fair, honest, and independent means the perpetual esteem and remembrance of his fellow men."

In 1882, at the annual meeting of the Royal College of Veterinary Surgeons, a vote of thanks to the President, Mr. George Fleming, was cordially agreed to for his successful efforts in the passing of the Veterinary Surgeons Act, which now makes it illegal for any one to call himself a Veterinary Surgeon, &c. unless his name be on the register of the R.C.V.S.

In 1882 Mr. Fleming brought out his second volume on *Animal Plagues*, and of it the *Lancet* of December 18, 1882, says :—

"Previously to the outbreak of cattle plague in this country, the history of animal plagues had not attracted much attention, and when the ravages of the malady forced veterinarians and stock-owners into a state of unaccustomed activity, it did not seem to occur to those who were most concerned that the disease was not a new one in veterinary medicine, and for some time England presented the remarkable spectacle of a people seeking with much effort and by circuitous paths information which was lying ready to hand, or at least to eye, in the veterinary literature of Germany and Austria. Had the history of the cattle plague been familiar to English

stock-owners in 1865, the saving to agriculture would have been immense, but at that time there was no accessible English work which gave any useful information on the subject, and our farmers, even if they had known anything of the distinguished Continental authors who could have enlightened them, are somewhat prone to depreciate the benefits of foreign imports.

"It is difficult to convey an adequate idea of the scope and objects of the work on Animal Plagues without entering further into details than our space will permit, but there need be no hesitation in asserting that the two volumes on Animal Plagues, added to the companion volumes on Veterinary Sanitary Science and Police, and Rabies and Hydrophobia, are evidence of the remarkable industry by the aid of which their author has surmounted difficulties of no ordinary character.

"The volume now before us is, we are told, the finish of the writer's labours in this direction. In the first volume, which was published in 1871, the history of epizootics, and incidentally of epidemics, included the period from B.C. 1490 to A.D. 1800. In the present volume the history is continued from 1800 to 1844, after which date the writer remarks, it is not his present intention to carry on the record, as from that time 'Veterinary literature became largely developed, and there is no difficulty in tracing the origin and extension of the more remarkable at least of the animal plagues which visited the civilised world. Nevertheless to present in one view a record of the principal epizootics which have appeared since 1844 would be a satisfactory conclusion to the work; and although it might present no difficulty to Mr. Fleming, we question if any of his professional brethren are likely to attempt it.

"In carrying out his self-imposed task, the author has adopted the system of chronological reference, instead of attempting a complete history of each form of disease. Commencing in the first volume with the murrains of Egypt, in the first chapter he gives an account, necessarily a concise one, of the plagues which the earliest historians have alluded to between 1490 B.C. and 400 A.D. Then, in the next chapter, in the space of some ninety pages, is compressed the history of eleven hundred years—from A.D. 400 to A.D. 1500—an unprofitable period, as the writer describes it.

"Coming gradually to more modern times, the accounts of epizootics in various parts of the world become the more interesting, for the reason that it is possible to connect the animal plagues of a former period with those which are familiar to this generation of stock-owners. As a concise record of the rise and progress of animal plagues from the earliest times, the value of the work to the veterinarian cannot be overstated, and it may not be out of place to suggest that the agriculturist will find in it matter well worthy of his attention. In the last twenty years the stern logic of facts has convinced farmers that the ravages of the most deadly diseases of the lower animals are not, in their outcome, to be lightly estimated; and they are not now disposed to laugh, as they did in 1862, at the idea of legislating for the movement of animals merely because they had a few blisters on their tongues and feet. Mr. Fleming's work is likely to find readers among a class to whom a few years ago its teachings would have seemed to possess no meaning."

On April 28th, 1883, Mr. Fleming received the honorary degree of

LL.D. from the Senatus of the Glasgow University; and on June 26th, 1883, Dr. Fleming was gazetted Principal Veterinary Surgeon to the Army, and at a levee at St. James' Palace held by the Prince of Wales on February 22, 1884, on behalf of Her Majesty the Queen, Dr. Fleming was presented by His Royal Highness Field-Marshal Commanding-in-Chief.

In 1884 Dr. Fleming produced the first volume of a *Text-Book of Operative Surgery*, and of it the *Lancet* of February 21, 1885, says:—

"This work does not profess to be a manual of veterinary surgery, but is intended to supply a want which has been long felt—an intelligible and practical description of the manual details of the various operations which it may be necessary to perform on animals. It does not, therefore, treat of the diagnosis of injuries, but takes up the subject when it has been decided to perform a surgical operation, and describes the manner in which, and the instruments by means of which, this may be done, with full instructions as to the measures requisite to prevent, or at least diminish to the utmost, the dangers to be apprehended from the struggles of the animal. In an introductory chapter Mr. Fleming points out forcibly the necessity for a sound knowledge of anatomy, physiology, and pathology for the successful practice of surgery. 'As in clinical medicine, so in surgery, skill in *diagnosing* is an important element of success. . . . A great secret of success is to know when to act and when to abstain.' The book is divided into two parts. The first treats of the manner of securing animals for operation; the employment of anæsthetics; and elementary operative surgery, including bandaging and dressing wounds. The second part, under the head of General Operations, includes the *operative* treatment of dislocations and fractures, the removal of tumours, cauterisation, galvano-puncture or electro-puncture, setons, injections, inoculations, operations on blood-vessels, muscles, tendons, nerves, and fasciæ; amputations, and extraction of foreign bodies from wounds. In addition to the description of the mode of operating, the book contains numerous illustrations of the instruments required, the manner of using them, and the various sutures and bandages which may be needful after an operation. As might be expected, Mr. Fleming protests against the performance of operations on animals in compliance with a mere fashion, such as 'docking' or 'knicking' of a horse's tail, cropping dogs' ears, or cutting their tails. 'These operations, which, after all, are only fashionable mutilations of perfect animals devised by a morbidly artificial and corrupt taste, should be suppressed, if not by law, law, at least by the influence of the surgeon.' The objection of course does not hold good when the operation is performed for the cure of disease or injury, or removal of deformity. The volume is in every way worthy of the author's reputation and high standing in his profession, and cannot fail to prove instructive; it should be in the hands of every young veterinarian, and would doubtless be found very useful for reference in the library of men of more advanced standing. We regret to add that it has the serious defect of having no table of contents and no index; both of which, with a list of the illustrations, would greatly enhance its value, and will, we trust, be added to the next edition."

On October 7th, 1886, Dr. Fleming in a letter to the *Times* advocated the assistance by the public of the Royal Veterinary College, and we wish we had such an able advocate at the present time for the Veterinary Colleges in Scotland.

"THE ROYAL VETERINARY COLLEGE.

"Sir—In the brief report of the opening of the Royal Veterinary College which appears in *The Times* of to-day no mention is made of the remarks made by the chairman, the Right Hon. Lord Ribblesdale, subsequent to the excellent address delivered by Principal Robertson. As these remarks had reference to the present and future welfare of the school, and therefore to the progress of veterinary science in this country—a matter of great public importance, not only to the United Kingdom, but more or less to the whole Empire—I beg the favour of being permitted to allude to the subject in your columns. This, the first veterinary school established in this country, leased premises on very advantageous terms in Camden Town some ninety years ago. The lease expired recently, and, owing to the greatly increased value of the property in that locality, the new lease which had to be entered into not only deprives the College of certain rents which it annually received from properties included in the first agreement, but exacts a much higher rent than formerly. It is to be observed that the institution, unlike the veterinary schools in every other European country, which are maintained out of public funds, is entirely self-supporting, and for the last sixty years has received no assistance whatever from Government, its income being depenpent upon the fees of the students and the sums paid by subscribers, who are thereby entitled to certain privileges. This income is consequently fluctuating and precarious, and during the old lease barely sufficed to cover expenses, that, owing to the continually-increasing demands for extended instruction, were ever augmenting. Now, from the enhanced rent, the greater outlay in keeping the school efficient, and no addition to the income, the financial position of the establishment is anything but satisfactory, and the outlook causes much anxiety, especially in view of the urgent necessity that exists for keeping the standard of education always abreast of ever-advancing knowledge. The serious state of affairs here described engaged the earnest attention of the Governors at the annual meeting in July last, when His Royal Highness the Duke of Cambridge, President, occupied the chair, and it was then decided that steps should be taken to avert disaster, if possible, by informing the public of the pecuniary needs of the College and of the prominent claims it has to the sympathy and help of the community, particularly of agriculturists and others interested in the domesticated animals. The value of adequate veterinary teaching can scarcely be over-estimated in considering the interests and requirements of an empire such as we possess, and which is chiefly agricultural. Veterinary science embraces so many points in the material prosperity of mankind that it cannot be neglected by any civilised nation with impunity. The breeding, rearing, and improvement of animals, their maintenance in health, and recovery from sickness or injury, their protection from decimating plagues, and the preservation of human beings from grave maladies which can be communicated to them from diseased creatures, are some of the benefits which this science can confer if carefully fostered and encouraged. The securing of skilful and humane treatment, medical or surgical, for suffering animals, and which is based on a thoroughly sound and scientific training acquired by the veterinary surgeon intrusted with this task, touches, more or less directly, the pecuniary interests of every owner of stock or possessor of animals in

the kingdom—and that is placing the matter on the very lowest footing; for there can be very few proprietors, even of such creatures as the dog and cat, who would not, as an affair of humanity, wish to have the advantage of scientific advice and treatment for them when ailing and in pain. From a sentimental point of view, humanity must always be deeply concerned in the skilful medical and surgical treatment, no less than in the proper management, of our dumb co-citizens, which minister so largely to our wants and pleasures. While the nation, through its civil and military sections, has benefited, and now benefits, immensely from the services rendered by the Royal Veterinary College, which has taught more than 3000 students since its foundation, individuals who desire to have their animals receive veterinary assistance from it are offered certain privileges in this direction for the small annual subscription of two guineas.

"I am sure, sir, that the necessities of this valuable institution need only to be made known through your powerful influence and consideration to receive the assistance and encouragement of which it stands so much in need. The Continental veterinary schools require no appeals like that I now venture to make; they receive thousands of pounds from their respective Governments every year to keep them efficient. Ours receives nothing from the nation, and renders quite as valuable services.

"I have the honour to remain, yours obediantly,

"GEORGE FLEMING, LL.D., F.R.C.V.S.,
"*Principal Veterinary Surgeon to the Army.*

"October 2."

On the 25th of June 1887 Her Gracious Majesty, on the occasion of her jubilee, conferred upon Dr. Fleming an appointment as an Ordinary Member of the Civil Division of the Third Class, or Companion of the Most Honourable Order of the Bath.

In 1889 Dr. Fleming published a special article on the Army Horse Supply, and showed the enormous, nay, insurmountable difficulty in those days of getting additional hundreds of horses, far less thousands, for a scheme of mobilisation of *two* Army Corps.

In the same year Dr. Fleming issued his book on *Laryngismus Paralyticus*, which created considerable commotion amongst the owners of roaring thoroughbreds and others.

(*To be continued.*)

THE HORSES OF COMMERCE.

THERE is no subject which "fills the eye," either of the public or the farmer, more at the present moment than that of the breeding of horses. This is a result of the good demand and excellent prices for animals of the necessary types and quality which now prevail over the whole world, and which bid fair to continue for some time to come. As a consequence of the prevailing state of things, the breeding of horses is extending to an extent that is but little realised, and there is but little doubt that in the course of a few years the annual output will be largely increased. It will be of great benefit if this undoubtedly useful movement is guided properly and directed on the lines of profitable production. This is the view of the

Illinois Experiment Station, which has just issued a very suggestive and voluminous bulletin on the subject. It was prepared because an inquiry showed that of the horses which find their way into the great markets only about 60 per cent. are of a marketable class, leaving 40 per cent. of a class for which there is no general demand, and which are rarely sold at a profitable price. The Experiment Station authorities do not believe that the failures of any breeder of horses ought to amount to 40 per cent. or anything like it. Even if a very high standard of production was aimed at, a breeder working with good blood ought to succeed seven times out of ten; and in making that statement it is stated that in that case considerably more than 70 per cent. of the animals would meet market requirements. That is to say, they would meet a demand that is large and constant. The reason why so large a proportion fail to come up to any valuable standard whatever is because many breeders have no standard whatever at which they aim. Their horses are not produced for distinct purposes or bred to definite ends as generally or as successfully as they should be. In order to help farmers to eliminate this weakness in their breeding methods, the various market standards and classes for horses are described and discussed.

Before doing so, however, it is pointed out how largely the matter affects the ordinary farmer. Most of the horses that supply the great markets are produced upon the farms of the country by farmers largely engaged in crop raising, and with other kinds of live stock. Only a small proportion are produced by large studs. A somewhat extended study of the matter reveals the fact that but few of these farmers have any definite knowledge of the distinct classes recognised in the markets, or of the types and characters demanded for each. They therefore work in the dark, with no model in mind and no standard to work to. The result is that a large proportion of the horses that are suited to the market needs are produced not by design, but by accident. "This is borne out not only by the 40 per cent. of unclassed horses that go to the markets, but also by the unnumbered mob of 'scalawags' that remains behind on the farms, too bad to sell, but which are kept 'to raise colts.' It is therefore the ordinary farmer who raises one or two horses, rather than the recognised horse-breeder on a more or less larger scale, that needs further information as to the value of a definite aim in the production of market horses."

The useful market classes of horses are not based on any points of breed, but on the suitability of the animals for the uses to which they are to be put, and the best horse to breed is the one that most fully meets a definite, constant, and strong demand, and has therefore a high average selling price. It is because the uses to which horses are put are definite, though distinct, that market types and classes are fixed. But, although these uses are exceedingly varied, there are often wide gaps between the market classes, and a horse that drops in one of these gaps, no matter how good he may be as an animal, is a cheap horse, either because there is little use for him, or because the supply is unlimited. Speaking generally, the types and classes of horses mostly in demand at the great markets are almost entirely fixed by the needs of the cities, both foreign and domestic. So far as America is concerned it has been found that, with but slight variations, the home demand of the country calls for the same classes and types as those demanded by the foreign trade, and this experience is believed to be universal. Moreover, the demand for the classes and types is so par-

ticular and defined that horses making their way to the great markets of the world are classified and graded, and sold according to their classification as accurately and as absolutely as wheat, or any other commodity. Although the classes differ somewhat in different markets and countries, it may be said that all over the world there are four distinct and well-defined market classes in large and universal demand. These are (1) road, carriage, and coach horses; (2) cab horses; (3) 'bus horses; and (4) draught horses. These four types are those which are equally in constant demand in this country, and a few notes on each will be useful.

Road, carriage, and coach horses form the highest class of unregistered horses on the market, though many are of the highest breeding and all must show good blood. They are distinctly driving horses, though not racers, and are used for private work as distinct from public service. They are put to varied uses, and this admits of a fairly wide range in height and weight. Horses may vary in height from 15 hands to 16 hands 2 inches, and in weight from 1100 to 1000 lbs. and still rank in this class, though these are extremes. The typical specimen would stand from 15·3 to 16 hands, and weigh from 1100 to 1150 lbs. In colour there is little choice between bays, blacks, browns, chestnuts, and sorrels, but light greys are not in favour, and unsightly colours and markings are barred out. The form, style, and action, however, must be strictly high class, and, whether registered or not, they must show plenty of good breeding. Every line and movement should please the eye and satisfy the demand for a stylish horse. Horses in this class sell at from £30 to £60 and upwards, fine specimens selling readily at £80 to £100, and in some cases £200 and even more. These horses are worth from 25 to 50 per cent. more when a pair is well matched, and in all cases the value depends greatly on the training and manners shown. The production of these horses is brought about by the use of good pure-bred sires on brood mares of good form and substance, and of a size and type which corresponds with the blood of the sire. But whoever undertakes to produce horses of this class should send the produce to market untrained, unless they are trained by a thoroughly competent horseman. Some of the finest specimens are permanently ruined by bad handling long before they reach the markets.

Cab horses form the second class, and these are, as the name indicates, used on cabs and other light vehicles for public service. They are also used for light delivery work, and those used for this purpose by the better mercantile houses are the pick of this type. These two uses fix both the class and the price, although many are found in other uses where plain light driving is required. The horse required for this class is a strong, blocky, and useful little animal, 15 hands to 15·2 hands high, and weighing from 1050 to 1100 lbs. He must be a "rugged" horse, but he is plain, and is required to show but moderate action; he must, however, be able to go long at the trot and handle some load. While an exceedingly useful horse and one demanded in large numbers, the supply is very large and values are always moderate. In the largest horse market in the world—that at Chicago—the general prices rarely exceed £15 to £20. He is a good, but plain and cheap horse, and the prices show that no one is warranted in undertaking its production as a definite aim. There is a large supply, but this is due to the fact that this class is mainly supplied by culls from the "road, carriage, and coach" class.

'Bus horses form the third class, for which there is a large and regular

demand. The class takes its name from the fact that the great demand is for their use in omnibuses. A second use is scarcely less important, and that is for "express" horse and moderately heavy delivery. They are used in pairs, and must imperatively meet two requirements. They must be able to handle a considerable load in the first place; and, in the second, must be able to do it at a slow trot and sustain the gait. It will thus be seen that if there is any "general purpose" horse it is the "'bus" horse. He must be able to handle a load at a slow trot, but is not required to show style; his action, however, must not be bad, and it must be easy. He must be a smooth-made horse, shape himself well in harness, give plenty of stamina, and should stand from 15·1 to 16 hands, and weigh from 1250 to 1400 lbs. He must not be a small draught horse, for his gait is to be the trot and not the walk. These horses sell readily in the Chicago market, both for export and home use, at from £20 to £30 each. It is worth noting that neither for these horses, nor for the "cab" horses of the previous class, are there any fancy prices, and for the simple reason that there is no fancy service for them to perform. "Their work," we are told, "is purely commercial, and their values are as standard as that of wheat, and fluctuate only within narrow limits according to individual quality like any other purely commercial article." The "'bus" horse is the cheapest horse that it will ever pay to produce by direct effort. It can be produced in many ways, but in America the best results are obtained by a medium Percheron stallion on a small mare, the latter having fairly good action and plenty of bone and stamina. They should be sold without training, except that they should be broken to harness and accustomed to light work. These are not "driving" horses, and on no account should a breeder attempt to develop speed.

Draught horses form the fourth and perhaps the most important class of all, of horses for which there is a fixed demand of a constant character. It has one standard use, and that is to haul enormous loads at the walk only, generally in the cities on paved or hard roads. They may be used singly, in pairs, three or four abreast, unicorn fashion, or in four (or even six, eight, or ten) horse teams two abreast. Strength is the one consideration, and, broadly speaking, weight is the principal element. If, however, the mechanism of the horse is to endure the strain, he must have a strong hind leg, especially at the hock; a heavy loin, with a short coupling; and a strong front leg and dense hoof, because so large a proportion of his weight is or should be in front. With the draught horse it is not a question of height, but of weight; indeed, the nearer the ground he is the better, both for service and endurance. For this class an animal must weigh not less than 1500 lbs. in good flesh; he is all the more valuable if he weighs 1800 or 2000 lbs., or even more. He cannot be too heavy if his "bone" corresponds to his weight. Draft horses of good form sell almost according to weight, except that as weights increase prices rise at a much greater ratio. Extreme weights bring enormous prices, if only the bone is satisfactory. In the Chicago market prices range for the general run from £25 to £50 each, and occasionally higher, and with an increase of about 10 per cent. when matched in teams. These prices are sometimes exceeded, and it is said that prices have never been so low that a pair of draught horses, if matched and good enough for the class, would not make £120. This is *par excellence* the horse for the farmer to raise. Only the blood of the best draught breeds, and the heaviest and best boned stallions, should be used.

Even then the use of large mares that are good milkers is necessary, if heavy weight is to be obtained in the progeny. In no other way can colts be produced with sufficient bone and feeding quality to attain the size and finish demanded by the markets. Even then the youngsters must be supplied with the best of food in large amounts from the very first.

These four practically form the standard classes for which there is always a demand in the markets. There are a number of other classes with distinct requirements, but for these the demand is either irregular or limited, or is generally met from the general supply in the above classes. The cavalry and the artillery horse, and the fire and police horses are examples of these. There are times, as has been the case lately, when the first-named horses are called for in large numbers, but as a rule the demand is irregular, and when it comes with a rush it is fully met by the general stock in hand. They offer no inducement to the general horse-breeder to produce that type as a special object. What a farmer who breeds one or two horses should do is to keep himself acquainted with those standard classes which are in steady demand at uniformly good prices and breed these. He will then always find a remunerative market for his produce.

(*The Land Agents' Record*, April 13th, 1901.)

Extract.

A NEW METHOD OF BLOOD EXAMINATION.

Dr. L. Baruchello gives an account of his method, which is as follows:—Blood is taken from the jugular and caught in a sterilised capsule or other vessel with a flat bottom, which is carefully closed. The blood is then allowed to coagulate at a fairly high temperature, then the serum is drained off, and the clots of blood are placed in alcohol. On the following day the latter are cut into small cubes and again placed in alcohol. Further examination proceeds in this way, that the cubes are first drawn through alcohol, and then through alcohol and ether; then, enclosed in celloidin, they are cut with the microtom and coloured. The sections exhibit strong cohesion. The corpuscles appear like a regular mosaic. In the case of dead animals he takes the clotted blood to be examined from a great vessel, not from the heart, because in the latter, at the time of death, there occurs nearly always a partial separation of fibrin, which contains few coloured blood cells.

Dr. Baruchello claims the following advantages for his method:—(*a*) the blood which has been coagulated and cut into cubes may be preserved in alcohol as long as one wishes, and the examination may be undertaken as opportunity occurs; (*b*) the intrusion of foreign microbes into the blood to be examined may easily be avoided, and this is not the case in the usual method, in which the puncture is made into the previously disinfected skin, and a drop of blood on the glass is dried in the air; (*c*) the blood, coming direct from a great vessel, is, in point of composition and the numerical relation of its morphological elements, much more uniform than that obtained through skin-puncture; (*d*) when the microbes in the circulation are not numerous they may easily escape the eye of the investigator when

examining a small quantity of blood, whilst, in the case of a series of sections, they cannot possibly escape him; (*e*) the method is very simple, and requires no special instruments.

(*Il Moderno Zooiatro.*)

Review.

PUBLIC ABATTOIRS AND CATTLE MARKETS. 2nd Edition. By OSCAR SCHWARZ, M.D. Edited by G. S. HARRAP, A.M.I.C.E., &c., and LOUDON M. DOUGLAS, A.M.I.C.E., &c. Published by the "Ice and Cold Storage" Publishing Co., Limited, 89 Farringdon Street, London, E.C.

It is with great pleasure we bring this work before the notice of our readers, as it is filled from corner to corner with information of the greatest value to the veterinarian. It contains fifteen chapters, and in each of these are numerous good illustrations. Among the many subjects dealt with are chapters on the laws relating to the erection of public slaughterhouses; arguments for and against compulsory slaughter in public abattoirs; general remarks on the situation of a slaughterhouse; special description of individual buildings of a slaughterhouse; purification of sewage and utilisation of manure; management and staff; utilisation and destruction of unsound meat; insurance of animals for slaughter; the cattle market; the market halls. In chapter X. there is a special article on the training of veterinary inspectors, which is most interesting reading. We heartily commend the addition of this work to our readers' library.

Notes and News.

CALVES IN IRELAND.

Mr. Wyndham (Dover), in reply to Mr. Daly, said the Department of Agriculture in Ireland was now investigating the causes of the serious mortality amongst calves in that country, and was securing the services of the eminent bacteriologist Professor Nocard. The Principal of the Veterinary College in Ireland would assist in the researches.—(*House of Commons, 23rd April.*)

RABIES IN DOGS.

In the House of Commons Colonel Wyndham Murray asked at the end of last week the number of cases of rabies in dogs reported in the year preceding the date on which the regulations of the Agricultural Department came into force, and the number of cases reported at the present time. The Minister of Agriculture in reply stated that in 1895 there were 672 cases of rabies; in 1896 there were 438; in 1900 there were 6; and 1901 up to May 4th there was 1.

THE PREVENTIVE TREATMENT OF RABIES IN BERLIN.

THE official reports of the German Public Health Bureau give statistics of the working of the Rabies Department of the Berlin Institute of Infectious

Diseases. From these it appears that of 137 persons inoculated there in 1898 not one has, after the lapse of more than a year, developed hydrophobia. In 1899 the number of persons who went to the Institute for treatment was 384. One of these died of chronic renal disease while under treatment, two were brought to the department suffering from hydrophobia, and died there, and one fell ill on the twelfth day, and died of hydrophobia while under treatment. A little girl aged nine developed the disease on the sixth day after discharge, and another, aged four, on the fourteenth day after the completion of the treatment. Leaving out of account the first four of these deaths, the mortality in the 380 remaining cases was 0·52 per cent. Of the total number of patients, 290 were bitten by animals experimentally proved to be rabid, 44 by animals in whom rabies was diagnosed by veterinarians, and 50 by "suspect" animals. In the last of these classes the nature of the disease was made almost certain by the circumstances. The bites were in 359 cases inflicted by dogs, in 8 by cats, in 4 by horses; 9 patients became infected while treating rabid cattle; a laboratory servant was bitten by a bitch suffering from "street rabies;" two patients wounded themselves in making a post-mortem examination of a girl who had died of hydrophobia, and one in making a necropsy of a rabid pig.

We are using Tannaform in a number of cases, and so far with most satisfactory results. We hope to give a further report on the drug in our next issue.—Ed. V. J.

We are pleased to hear that Civil Veterinary-Surgeon Runciman, who has been seriously ill in South Africa, is slightly improved.– *May 22nd.*

The Honourable Stephen Coleridge informs us that he has received another cheque for £1000 from an anonymous donor in aid of the funds of the National Anti-Vivisection Society.

THE WAR GAZETTE.

The "Bavarian" left England, May 11, having on board the following invalids :—

Veterinary Department.—Lieut. G. Condor.
Army Veterinary Department.—Capt. J. Young.
The following is mentioned in the list of non-commissioned officers and men for their "valuable services" in the appendix to Lord Kitchener's despatch of March 8 :—Imperial Yeomanry—Farrier-Sergt. Spreull.

The steamship "Kildonan Castle" left for England, April 30, having on board the following invalid—Civil Vet. Surg. S. G. Chellew.
Following on passage home—Civil Vet.-Surg. E. A. Bogart.

In our extract from the *War Gazette* of April 19th, 1901, amongst the Honours and Promotions there should be read—To be an Ordinary Member of the Third Class or Companion of the Most Distinguished Order of Saint Michael and Saint George—Veterinary-Major Charles Rutherford, A.V.D., and not as therein stated.

CONTAGIOUS DISEASES ANIMALS ACTS, 1864 AND 1890.

SUMMARY OF RETURNS OF OUTBREAKS for the Five Weeks ending 18th May 1901.

ENGLAND AND WALES.

Swine Fever.	Anthrax.	Foot and Mouth Disease.	Glanders (including Farcy).	Rabies.	Sheep-Scab (for month of April).
Outbreaks 708 Slaughtered 3017	Outbreaks 56 Attacked 64	Outbreaks 0 Attacked 9	Outbreaks 130 Attacked 228	Dogs Attacked 1 Other Animals 0 Destroyed 2	Outbreaks 66

SCOTLAND.

Outbreaks 11 Slaughtered 99	Outbreaks 28 Attacked 42	None.	Outbreaks 2 Attacked 4	None.	Outbreaks 7

IRELAND.

Outbreaks 30 Slaughtered 572	None.	None.	None.	Dogs Attacked 0 Other Animals 0 Destroyed 9	Outbreaks 54

Communications, Books, Journals, &c., Received.

Agricultural Journal (Cape of Good Hope); Berliner Thierärztliche Wochenschrift; La Clinica Veterinaria (Milan); Deutsche Thierärztliche Wochenschrift; Tannoform in Veterinary Medicine (March); The Sanitary Journal; Scottish Medical and Surgical Journal; Veterinary Record; La Riforma Veterinaria; Le Mois Scientifique (Paris); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Johns Hopkins Hospital Reports; Journal of Comparative Medicine and Veterinary Archives; Recueil de Médecine Vétérinaire; Gazette Médicale de Paris; Modern Medicine; Johns Hopkins Hospital Bulletin; Il Veterinario di Campagna (Moncalieri); Le Bulletin Vétérinaire (Orleans); Revista de Medicina Veterinaria (Bucarist); La Revista Veterinaria (Buenos Aires); Zeitschrift für Fleisch-und Milchhygiene (Berlin).

Received for Review.—Annual Report for the year 1900 of the Principal of the Royal Veterinary College to the Council of the Royal Agricultural Society of England; Insect Pests of Domesticated Animals, by R. Stewart MacDougall, M.A., D.Sc., Consulting Entomologist to the Highland and Agricultural Society of Scotland; Report of the Deputation of the Market Committee of the Town Council of Belfast on its Visit to certain Abattoirs in England and on the Continent; Annual Report of the Sanitary and Markets Departments of the City of Edinburgh for the year 1900, by A. Maxwell Williamson, M.D., B.Sc.; Annual Report on the German Pharmacœpia, by E. Merck, Darmstadt.

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503	Atropine Sulphate, 1-2 gr.	8/6
504	Cocaine Hydrochloride, 1 gr.	13/
505	Colchicine, 1-4 gr.	8/6
506	Colchicine, 1-2 gr.	13/6
507	Coniine Hydrobromide, 1 gr.	20/
508	Digitalin, pure, 1-8 gr.	4/4
509	Digitalin, pure, 1-4 gr.	5/
	Eserine, *see Physostigmine.*	
510	Hyoscyamine, pure, 1-8 gr.	10/
511	Morphine Sulphate, 1 gr.	8/
512	Morphine Sulphate, 2 grs.	15/
513	Morphine and Atropine, Morphine Sulphate, 1 1-2 grs. Atropine Sulphate, 1-2 gr.	15/
514	Physostigmine Salicylate, 1-4 gr.	22/
515	Pilocarpine Hydrochloride, 1-2 gr.	33/9
516	Sodium Arsenite, 1 gr.	4/
518	Strychnine Sulphate, 1-2 gr.	5/
519	Strychnine Sulphate, 1 gr.	7/
521	Veratrine Hydrochloride, 1-2 gr.	5/

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COUGHS, COLDS, ASTHMA, BRONCHITIS.

DR. J. COLLIS BROWNE'S CHLORODYNE.—Dr. J. C. BROWNE (late Army Medical Staff) DISCOVERED a REMEDY, to denote which he coined the word CHLORODYNE. Dr. BROWNE is the SOLE INVENTOR, and, as the composition of Chlorodyne cannot possibly be discovered by Analysis (organic substances defying elimination), and since the formula has never been published, it is evident that any statement to the effect that a compound is identical with Dr. Browne's Chlorodyne *must be false.*

DR. J. COLLIS BROWNE'S CHLORODYNE. — Vice-Chancellor Sir W. PAGE WOOD stated publicly in Court that Dr. J. COLLIS BROWNE was UNDOUBTEDLY the INVENTOR of CHLORODYNE, that the whole story of the defendant Freeman was deliberately untrue, and he regretted to say it had been sworn to.—See *The Times*, July 13th, 1864.

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